HANDBOOK

OF

COMMERCIAL INFORMATION

FOR INDIA

BY

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PREFACE

THE object of this Handbook is to give readers in other parts of the world a bird's-eye view of the foreign trade of British India. The undertaking was suggested by Mr. Chadwick, Indian Trade Commissioner in London, who pointed out that though Sir George Watt's 'Dictionary of the Economic Products of India' and the abridgment of that work entitled 'The Commercial Products of India' contain much valuable information, they are not compiled on lines directly helpful to business men and omit many details which foreign traders want to know. A handbook containing many of the features suggested by Mr. Chadwick, but dealing with the trade of the Madras Presidency only, appeared in 1916, and the Consular report compiled by Mr. Baker, American Consul at Bombay, and published in Washington in 1915, contain much of the necessary material, but as the latter was written chiefly with the object of interesting American exporters in India's import trade, the information to be found in it regarding exports is generally not sufficiently detailed. From the point of view from which the present book is written the import trade is of secondary importance, and general economic conditions and the difficulties of currency and finance which have hampered commercial development in India from time to time have only been briefly alluded to. In the case of every article of present or potential importance figuring in the statistics of exports however an attempt has been made to specify the areas in which it is obtainable, the port or ports from which it is shipped, the method of marketing and the unit of sale and shipment. India is so vast and so remote that there is no doubt that on the Continent and in America, if not in the United Kingdom, abundant ignorance prevails

with regard to the commercial geography of the country and her trade potentialities. The earlier chapters in the Handbook deal with the principal ports and enumerate the facilities for trade at each, while the chief commercial organisations are enumerated and their activities described. Elsewhere will be found a conspectus of the various weights and measures in use in the chief trade centres, while the appendices contain the tonnage schedules in force at the five principal ports and a glossary of the vernacular terms which occur in the book. It is hoped that this varied material will enable all who are anxious to purchase India's manufactures or raw materials to make larger use of the opportunities which undoubtedly exist for increased trade.

I take this opportunity of expressing my grateful acknowledgments to the numerous friends, official and non-official, who have scrutinised my draft articles and assisted me with material. Among the numerous books consulted in addition to those referred to earlier in this preface, the Quinquennial Review of Mineral Production in India (1909-1913) and the Munitions Board Handbook (1919) have been found particularly helpful. My clerk, M. A. Krishnan, who has seen the book through the press and is responsible for the statistical tables and the index deserves special mention.

CALCUTTA :
26th September, 1919.

C. W. E. COTTON.

NOTE.—All the sterling figures in this volume are calculated on the basis of 1 Rupee = 1s. 4d.

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Handbook of Commercial Information

PART I

INTRODUCTORY

India is the largest of the three peninsulas which mark the southern configuration of the Continent of Asia. This peninsula falls into four well marked divisions. Firstly, the Himalayan range which forms a great natural frontier including the Valley of Kashmir and the Hill States of Nepal and Bhutan abutting on the great tableland of Tibet. Secondly, the Indo-Gangetic plain lying between the mountain range to the north and a line drawn from Karachi to Delhi and Delhi to Calcutta. South again of this line is the peninsula proper with an elevated plateau in the centre buttressed towards its southern extremities by two ranges of hills known respectively as the Eastern and Western Ghats, the former being much more distinctive and considerable. The fourth division Burma, which properly belongs to the Malayan peninsula, lies to the east.

Area.

The total area of the Indian Empire is 1,773,168 sq. miles, with a population (according to the Census of 1911) of 315,132,537 people. It is perhaps not generally appreciated what a large portion of this is not directly under British administration. The area of British India is 1,097,901 sq. miles, with a population of 245 millions, while the Native States comprise 675,267 sq. miles, with a population of 70 millions.

British India.

The territory under the control of the Governor-General in Council is divided into eight major provinces and five lesser charges, each of which is termed a Local Government. The Local Governments are the three presidencies of Madras, Bombay, and Bengal, the United Provinces of Agra and Oudh, the Punjab, Burma, Bihar and Orissa, the Central Provinces, Assam and the North-West Frontier Province. The minor administrations include Delhi, British Baluchistan, Coorg, Ajmer-Merwara, and the Andaman Islands. The following statement shows the administrative divisions of British India, and the present form of Government.

TABLE No. 1.—*The administrative divisions of British India with their area and population.*

Divisions.	Form of Government.	Headquarters. October—April.	Headquarters. April—October.	Area (sq. miles).	Population (1911 Census).
Presidencies—					
Bengal	Governor-in-Council	Calcutta	Darjeeling	78,412	45,483,077
Madras	,,	Madras	Ootacamund	141,726	41,405,404
Bombay*	,,	Bombay	Mahableshwar Poona.	123,064	19,672,642
Provinces—					
United Provinces	Lieutenant Governor	Allahabad Lucknow	Naini Tal	107,164	47,182,044
Punjab	,,	Lahore	Simla	97,209	19,974,956
Burma	,,	Rangoon	Maymyo	236,738	12,115,217
Bihar and Orissa	Lieut. Governor in Council	Patna	Ranchi	83,205	34,490,084
Central Provinces †	Chief Commissioner	Nagpur	Pachmarhi	100,345	13,916,308
Administrations—					
Assam	Chief Commissioner	Shillong.	Shillong	52,959	6,713,635
North-West Frontier Provinces	,,	Peshawar	Nctragali	16,466	2,196,933
Baluchistan	Agent to the Governor General	Quetta.	Quetta	45,804	414,412
Ajmer-Merwara	Commissioner	Ajmer	Mount Abu	2,711	501,395
Coorg	,,	Mercara	Mercara	1,582	174,976
Andaman and Nicobar islands	Superintendent, Port Blair	Port Blair	Port Blair	3,143	26,459
Delhi	Chief Commissioner	Delhi.	Delhi	573	412,821

* Including Sind and Aden.
† Including Berar.

Native States.

The map shews that, while a considerable portion of the interior is comprised of Native States, they contain no port of even second rate importance and except for Kathiawar, Baroda and Travancore the coast line is held practically without interruption by British Provinces. The consequence is that the contribution of Native States to the volume of exports, though undoubtedly considerable, is almost completely obscured in the statistical tables, as shipment is necessarily effected in most instances from British Indian ports. The largest Native State in area is Kashmir with Jammu in the extreme north-west but in wealth and population Hyderabad is the premier State and its ruler, the Nizam, is distinguished by the appellation of His Exalted Highness. Next in importance are the progressive States of Mysore, Baroda, Gwalior and Travancore, the first of which possesses great economic resources which are only just beginning to be developed.

The following table shows the principal Native States in India with their area and population.

TABLE No. 2.—*The principal Native States with their area and population.*

Name of the State.	Area. (Sq. miles).	Population. (1911 Census.)
Kashmir	84,432	3,158,126
Hyderabad	82,698	13,374,676
Nepal	54,000	5,000,000
Southern Shan States	40,434	900,202
Jodhpur	34,963	2,057,553
Mysore	29,461	5,705,359
Orissa Feudatory States	28,648	3,942,972
Gwalior	25,133	3,102,279
Bikaner	23,311	700,983
Kathiawar Agency	20,882	2,496,057
Bhutan	18,000	300,000
Jaipur	15,579	2,636,674
Bhawalpur	15,000	780,394
Northern Shan State	14,294	58,952
Udaipur	12,953	1,293,776
Indore	9,506	1,007,856
Manipur	8,456	346,222
Baroda	8,182	2,032,798
Travancore	7,129	3,428,975
Bhopal	6,902	730,383
Patiala	5,412	1,407,659
Alwar	3,141	791,688
Cochin	1,361	918,110
Cooch Behar	1,307	593,052
Pudukotta	1,178	411,878
Rampur	892	531,127
Kapurthala	630	268,244

Administration.

Since 1858 the Supreme Authority in India is vested in the Crown acting through a Secretary of State whose pay is furnished from Indian revenues. The Secretary of State is assisted by a Council whose constitution and functions

have recently been examined by a Committee in London. The administration of the Government of India is vested in the Governor-General who is also Viceroy, assisted by an Executive Council and the Commander-in-Chief as *ex-officio* extraordinary member. There are in addition six ordinary members who hold separate portfolios, the present distribution being Home, Revenue and Agriculture and Public Works, Commerce and Industry, Education and Sanitation, Finance, and Law and Legislation. Under the control of the Revenue and Agriculture Department are Irrigation and Forests, while railway affairs are in charge of a Railway Board which is connected with the Department of Commerce and Industry. Other departments controlled by the Department of Commerce and Industry are Posts and Telegraphs, Customs, Geological Survey and Mines and Statistics and the Northern India Salt Revenue Department. Foreign affairs are the special portfolio of the Viceroy. More detailed information is given in Part III of the work of the principal departments which have commercial or *quasi*-commercial interests. The administrative proposals contained in the report of the Industrial Commission, which sat from 1916 to 1918 under the chairmanship of Sir Thomas Holland include the creation of imperial and provincial departments of Industries and of an Imperial Industrial Service, the latter to be in charge of a member of the Viceroy's Executive Council, assisted by a Board of three members entitled the Indian Industries Board which would be responsible for the industrial policy of Government and the inauguration and carrying out of a uniform programme of industrial development throughout the country. These proposals are at the time of writing still under the consideration of the Secretary of State.

Directors of Industries have already been appointed for most of the major provinces with specialists and technical advisers to assist them and the number of the latter is likely largely to increase. The Commission has proposed the creation of provincial Boards of Industries, composed mainly of non-officials to advise these Directors, whom it is suggested should be given the status of Secretaries to Government to secure the more expeditious and effective despatch of work.

PART II

THE INDIAN RAILWAY SYSTEM

Length of Indian railway system.

The total length of railways opened in British India and Native States on 31st March 1918 amounted to 36,333 miles of which 17,876 miles were of the standard gauge (5′ 6″), 14,989 miles of the metre gauge (3′ 3⅜″) and 3,468 miles of other gauges (2½′ and 2′). These figures include the West of India Portuguese Railway (51 miles) running for all but two miles of its length in Portuguese territory and the Villupuram-Pondicherry and Peralam-Karikal lines (22½ miles) which are partly in French India. The total mileage under construction or sanctioned for construction at the same date aggregated 1,596 miles, but owing to financial considerations and the difficulty of obtaining essential materials while the war lasted, work in the case of most projects was entirely in abeyance.

Government of India's control.

The Government of India exercises under the Indian Railways Act, 1890, certain general powers in respect of all the railways in India and has a preponderating financial interest in nearly all of them. railway administrations for which the Government of India has to vide funds submit an annual programme to the Railway Board, ich prepares a general programme of capital expenditure for the en-ng year for the sanction of the Secretary of State. The Govern-nt of India makes budget provision for the needs of each railway ording to the programme finally sanctioned.

Railway expenditure.

The capital expenditure thus budgetted for during the last seven years has been as follows.

BLE No. 3.—*Capital expenditure budgetted for between 1913-14 and 1918-19 for railways.*

Year.	Capital expenditure.
	£
3-14	12,306,666
4-15	11,431,533
5-16	4,492,333
6-17	1,980,428
7-18	2,528,571
8-19	4,200,000*
9-20	17,70[illegible],100*

* Budget.

For many years the railway system was a drain upon the finances of the Government of India, but the tide began to turn with the expansion of irrigation in the Punjab and Sind, which made the North Western Railway one of the greatest grain-distributing lines in the world. Since 1900 there has only once been a deficit and that was in 1908-09 when an indifferent harvest in India coincided with the great financial collapse in the United States of America. From 1914-15 onwards the profits earned by State railways (State worked and Company worked) have been steadily increasing.

Railway surpluses.

TABLE No. 4.—*Profits earned by State Railways from 31st March 1913 onwards.*

Year.	Gross.*	Nett.†
	£	£
1913-14	17,973,000	5,757,728
1914-15	16,419,000	3,217,029
1915-16	18,489,000	4,076,000
1916-17	21,983,000	7,482,314
1917-18	25,042,000	9,992,134

* *i. e.*, Gross traffic receipts less working expenses
† *i. e.*, Gross profits less interest.

The corresponding figures for District Board and Native State Railways, etc., were as shown in the table below.

TABLE No. 5.—*Profits earned by District Board and Native State Railways from 1913-14 onwards.*

Year.	Gross profits.
	£
1913-14	2,414,667
1914-15	2,669,067
1915-16	2,462,133
1916-17	2,688,200
1917-18	2,764,200

The reduction in capital expenditure since 1913-14 has been due to circumstances arising out of the war, partly to measures of economy deliberately enforced, and partly to the difficulty experienced in importing materials and stores from Europe. The funds allotted since the outbreak of war for the construction of new lines have been kept as low as possible, and in 1917-18 did not exceed £47,000 if the amount spent on the construction of military railways is excluded; the expenditure on new lines including military railways in 1917-18 was £814,462. The actual capital outlay incurred by Government on the construction and purchase of railways

Capital expenditure.

(including liabilities yet to be discharged by Annuity and Sinking Fund payments) amounted on the 31st March 1918 to £367,438,689, while the corresponding figures for Native State Railways, and other lines financed by private enterprise District Boards, etc., was £45,481,066. During the war the construction and working of military railways in the East was dependent upon the Indian railway system to a very great extent for staff and materials. The metre gauge lines in particular surrendered a great deal of rolling stock, and in 1917-18 alone over 420 miles of open railway were dismantled in various parts of India to meet the military demands, chiefly in Mesopotamia, for additional permanent way. Altogether about 220 locomotives, 5,500 vehicles, 1,900 track miles of rails, and four and a half million sleepers have been supplied from Indian railways to the theatres of war, chiefly Mesopotamia.

Chief railway systems.

The diversity of conditions governing the relation of the State to the railways in India is due chiefly to the variations of policy adopted from time to time towards railway construction. Broadly speaking, the principal railways fall under three categories—firstly, the three railways owned and worked by the State, *viz.*, the North Western, the Eastern Bengal and Oudh and Rohilkhand Railways; secondly, those owned by the State but worked on its behalf by companies enjoying a guarantee of interest from Government, eight in number, *viz.*, the East Indian, the Great Indian Peninsula, Bombay, Baroda and Central India, Madras and Southern Mahratta, Assam-Bengal, Bengal-Nagpur, South Indian, and Burma Railways; and thirdly, lines the property of private companies and worked some by the owning companies and some by the State or by companies working State-owned systems, the principal being the Bengal and North-Western, Rohilkund and Kumaon and Southern Punjab systems. Besides these there are an increasing number of lines which are the property of Native States or District Boards or constructed under a guarantee of minimum interest given by such Boards. The mileage on the 31st March 1918 under the various gauges in Native States is shown in the subjoined table.

TABLE NO. 6.—*Mileage under various gauges in Native States in March 1918.*

Gauges.	Miles.
5′ 6″	962
3′ 3⅜″	3,201
2′ 6″	562
2′ 0″	302

History of construction.

The first line opened in India was from Bombay to Kalyan, a distance of 33 miles (one of three experimental railways sanctioned in 1849), but railway construction on an ambitious scale really dates from the acceptance by the Court of Directors of the East India Company of the policy

laid down in Lord Dalhousie's famous minute of 1853 advocating the construction by guaranteed companies of a series of trunk lines uniting the various provinces together and connecting the trade centres upcountry with the principal ports. By the end of 1859 eight companies with a contemplated mileage of 5,000 and an aggregate guaranteed capital of £52 millions had been floated in England, *viz.*, (*i*) East Indian, (*ii*) Great Indian Peninsula, (*iii*) Madras, now merged partly in the Madras and Southern Maharatta and partly in the South Indian, (*iv*) Bombay, Baroda and Central India, (*v*) Eastern Bengal, (*vi*) Calcutta and South Eastern, now merged in the Eastern Bengal Railway, (*vii*) Scinde Punjab and Delhi, now merged in the North Western and (*viii*) Great Southern of India (now South Indian) Railways.

Each of these companies contracted with the East India Company (or Secretary of State for India) to construct and manage a specified line in return for the provision of land and the guarantee of interest varying, according to the market rate prevailing when the various contracts were made, from $4\frac{1}{2}$ to 5 per cent., on the capital outlay. Half of any surplus profit earned in any half-year was to be retained by Government to be applied to repay of advances made under its guarantee and while the railways were held on 99-year leases the State reserved the right to take over any line after 25 or 50 years upon terms calculated to represent the Company's interest therein, against a corresponding right of the latter to surrender and receive payment of its capital at par. Very close control was instituted by Government over the management and working of the railways constructed on these terms, which, though of great political and military value, imposed in some cases a considerable burden upon Indian revenues, as the expectations in regard to profits were not in all instances realised owing to heavy initial outlay incurred in the construction of lines on the standard guage, uneconomical alignment and alteration of routes and more transitory causes such as the Mutiny of 1857 and the Orissa famine of 1865-67. The original policy was modified in 1862 in favour of construction under subsidy but without guarantee and with a minimum of Government interference, but this attempt to attract capital was a complete failure, and in 1869 it was decided to raise the capital required for railway construction in India by direct State agency and to make working expenditure a charge on current revenues. Simultaneously the right of pre-emption at the end of 25 years was in the case of several of the more important guaranteed lines surrendered by Government in exchange for the absolute right to half the surplus profits in any half-year. By the end of 1879 though 6,128 miles had been opened by companies and 2,175 miles by Government at an approximate cost, respectively, of £97,872,000 and £23,695,226, the Famine Commissioners appointed after the great famine of 1877-78 pointed out that construction was still 5,000 miles short of the mileage needed to secure protection of the country from the consequences of the seasonal failure and that the limit put upon the borrowing powers of the Government for railway purposes hampered progress. It was consequently decided once more to try and attract private capital under guarantee, and although the contract terms offered under the modified

guarantee system were less favourable than previously, several companies were formed which have since contributed materially to the development of the Indian Railway system. To this period belongs the application of the same principles to railway construction in Native States of which the pioneers were Baroda and Hyderabad.

The Railway Board.

The construction and management of State railways was under the control of the Public Works Department of the Government of India until 1905, when, as the result of Mr. Robertson's report, a Railway Board consisting of a Chairman and two members and Secretariat establishment was created to secure expert consideration of the larger problems of railway administration and finance and a more settled and continuous policy in railway construction. In addition to the preparation of the annual railway programme, the Railway Board decides all general questions of policy and economy and settles disputes between competing interests while its administrative functions include the construction of new lines by State agency, the approval of rates for passenger and goods, the settlement of train services and through traffic arrangements, the control and promotion of the staffs of State Railways and the audit and general supervision of the expenditure and working of lines in which the Government of India is principally interested. The offices of the Railway Board are in Simla from April to November and at Delhi from November to April. The companies working most of the Indian railways are sterling companies with *Boards of Directors in London, who communicate with the* Railway Board through the Agents of the lines in India. On these Boards a representative of the India Office holds a watching brief as Government Director. On the recommendation of the Committee on the Indian Railway finance enhanced powers were given to the Chairman in 1908 who has been since styled President of the Railway Board and given the status of a Secretary to the Government with direct access to the Viceroy, while the Department, which is no longer subject to the general direction of the Commerce and Industry Department, is known as the Railway Department.

Native States railways.

The rulers of Native States have grown more appreciative in recent years of the advantages of the improved railway communications within their territories, and as examples of recent construction, the Mysore-Arsikere and Bangalore-Chik-Ballapur Railways in Mysore State (the latter financed by an Indian Company under a guarantee from the Mysore Darbar), and the Quilon-Trivandrum line in Travancore, which were opened in 1917-18, may be cited. Some of these railways, *e.g.*, the Cochin-Shoranur Railway, have been constructed out of accumulated State balances.

District Board railways.

The importance of feeder lines as contributory to the growth of traffic in the main lines is now fully recognised, but the revision of the existing terms (which include rebates as well as guarantees) on which the Government of India is prepared to consider offers for the construction of feeder lines

with capital provided by companies floated in India or by local bodies, such as District Boards, is almost inevitable in the altered conditions governing the money market after the war, to make the concessions sufficiently attractive to prospective investors. On the 31st March 1918 proposals for the construction of an aggregate of 3,708 miles of railway in all parts of India under branch line terms, at an estimated cost of nearly 14½ millions sterling, were under consideration by the Railway Board. The option of raising part of the capital under guarantee terms and partly under rebate terms has so far been availed of in one instance only (the Mymensingh-Bhairab Bazaar Railway, 104 miles long, opened in 1917-18) and the special concession offered in 1915 in the form of a provincial guarantee of 1 per cent. for a limited period in supplement to the Imperial guarantee to secure the construction by branch line companies of railways in Assam has already been extended to two branch lines, namely the Chaparmukh-Silghat and Katakhal-Lalabazaar railways; and there are before Government several other projects to which it is proposed to apply these special terms. In order to find money for their lines District Boards in Madras have for considerable time past been allowed to levy a special railway cess and the railway properties of the Tanjore District Board afford a striking example of the financial possibilities of this system, the extension of which to Bombay and Burma is in contemplation. In other provinces, *e.g.*, Bengal, there are several lines which have been built under a guarantee of minimum interest given by the District Board concerned. Latterly, however, war conditions have prevented much in the way of actual construction except the Salem-Suramànga-lam line built by the South Indian Railway with funds provided by the Salem District Board and opened for traffic in 1917-18.

India-Ceylon route.

A new route for traffic between India and Ceylon was opened in 1914 *viâ* Adam's Bridge, where the extension of the South Indian Railway across the island of Rameswaram to Dhanushkodi is connected by a service of turbine steamers with the Ceylon Railway terminus at Talaimanaar across a 22-mile strait. The old steamship route from Colombo to Tuticorin has thus been practically superseded.

The standard gauge on Indian railways is 5′ 6″, but in 1870, chiefly for reasons of economy, the metre gauge of 3′ 3⅜″ was adopted provisionally for certain new lines, and has since been a permanent feature of the railway system. The trunk system will be practically complete when Burma is placed in direct railway communication with India either by the Hukong Valley, the Manipur or the coast route, though direct connections between Delhi and Karachi, Karachi and Bombay, and Raipur and Vizianagram on the broad gauge system remain to be completed.

In the following table the main results of the working of all Indian railways treated as one system are set forth, while in Appendix III will be found the principal railways with mileage open or in course of construction on the 31st March 1918 and the area and trade centres served by them.

TABLE No. 7.—*Main results of working of all Indian railways treated as one syste*

Particulars.		1913-14.	1914-15.	1915-16.	1916-17.	1917-18.
1		2	3	4	5	6
Total capital outlay, including ferries and suspense, on open lines (in thousands of pounds).	£	330,058	346,148	353,322	356,853	361,199
Gross earning (in thousands of pounds)	£	42,390	40,280	43,107	47,123	51,576
Total working expenses (in thousands of pounds) . .	£	21,953	21,827	21,946	22,269	23,512
Percentage of working expenses to gross earnings .	Per cent.	51·79	54·19	50·91	47·26	45·72
Net earnings (in thousands of pounds)	£	20,437	18,453	21,161	24,854	27,997
Percentage of net earnings on total capital outlay (item 1)	Per cent.	6·19	5·33	5·99	6·96	7·75
Unit-mileage of passengers (in thousands). . .	Unit-miles	16,614,068	16,022,849	16,528,646	17,846,064	16,204,392
Freight ton-mileage of goods (in thousands) .	Ton-miles	15,623,235	15,225,957	17,157,841	19,825,901	21,015,126
Average rate charged for carrying a ton of goods one mile .	Pence	·38	·36	·36	·33	·33
Average rate charged per passenger per mile—						
First Class	Pence	1·2	1·0	1·1	1·1	1·3
Second Class	„	·55	·52	·45	·42	·56
Intermediate Class	„	·26	·26	·26	·26	·33
Third Class	„	·19	·19	·19	·19	23

PART III

A.—DEPARTMENTS CONNECTED WITH TRADE

The Commercial Intelligence Department.

The Commercial Intelligence Department which came into existence in 1905 and is responsible for the collection and dissemination of commercial information forms a convenient link between the commercial public and the Government of India. It answers trade enquiries, effects trade introductions and publishes in the *Indian Trade Journal* (the weekly organ of the Department), statistics and other information of commercial value. The Director-General was until April 1914 also responsible for the compilation and publication of the Annual Review of Trade and all the statistical volumes issued by the Government of India, covering not only commercial but also judicial, administrative and agricultural subjects, now prepared by an independent authority designated Director of Statistics. During the past few years the volume of enquiries and of general correspondence has increased materially and the reorganisation of the Department on a larger scale is under the consideration of Government, with a view to enable it to pursue a wider range of activities. The place of the present Director-General of Commercial Intelligence will probably be taken by a Director of Commercial and Industrial Intelligence who will be assisted by two Deputy Directors, one at Calcutta and one at Bombay and by paid correspondents at other trade centres.

The Department is, through the medium of the Indian Trade Commissioner in London in close touch with trade developments, of interest to India, in the United Kingdom. Further, by arrangement with the Board of Trade, H. M. Trade Commissioners in the Dominions and Colonies correspond with the Director-General of Commercial Intelligence in Indian trade interests, report to him openings for Indian exports and reply to local enquiries for Indian goods and much has already been done to stimulate the overseas demand for Indian produce and manufactures. Sample consignments can be arranged for by the Department through firms of repute in India. Similar steps are also being taken to push Indian trade with Egypt, Palestine, Mesopotamia, Persia and the Far East with the assistance of consular and other British officers.

Commercial Museum.

Attached to the Department is a Commercial Museum at which samples of Indian manufactures are exhibited. The primary object of the Museum is to show enquirers exactly what goods can be obtained of local manufacture, whether for local markets or for export, of what qualities and at what prices. The number and range of samples have increased materially since the Museum was first started as exhibitors find that the free advertisement afforded by the Museum widens their range of customers

and leads to extensions of business. A special annexe to the Museum has been set apart for the exhibition of samples of articles in constant demand by consuming Departments of Government but hitherto obtained from abroad.

Commercial Library.

In the same building, and also controlled by the Commercial Intelligence Department is a commercial library which, like the Museum, is open daily free of charge to the public. It contains up-to-date books of reference on technical and scientific subjects, periodicals and reports, official and unofficial.

Indian Trade Journal.

The Indian Trade Journal gives publicity to all alterations in the Customs tariffs of the United Kingdom and other countries likely to affect Indian interests, reproduces all the crop forecasts published by the Director of Statistics and summarises all the more important subjects dealt with in the proceedings of the different Chambers of Commerce in India. Its future form and scope are under consideration in connection with the contemplated reorganisation of the Department above referred to.

The Department specialises on overseas trade subjects and welcomes enquiries relating to Indian trade, which should be addressed to the Director-General of Commercial Intelligence, 1, Council House Street, Calcutta.

The Geological Survey Department.

The Geological Survey Department has been in existence for nearly 70 years. It was organised by Dr. Thomas Oldham, who arrived in India for the purpose in 1851 ; at that time there was only one other geologist on the staff, but in the course of the next 12 years, the total strength of the department was raised to 12. Thirty years later it was 13, and in 1901, 50 years after it had been founded, that with the addition of two mining specialists, was still the sanctioned cadre. In 1906 the total staff was increased to 20, at which figure it still remains.

Activities.

The activities of the department are directed mainly to the completion of a geological map of India, and to the collection and dissemination of information regarding the mineral resources of the country. It also gives expert advice with regard to the administration of the rules for the grant of prospecting licenses and mining leases ; it is responsible for the upkeep and administration of the geological section of the Indian Museum ; it issues annual statistics of the output of Indian minerals, and it furnishes professors and lecturers in geology for various educational institutions in India.

The sanctioned cadre of the Department is at present : 1 Director, 3 Superintendents, 15 Assistant Superintendents, and 1 Chemist. Its headquarters are in Calcutta, but its activities extend to the whole Indian Empire. The survey parties usually leave for the field in October, returning to headquarters for recess in May. Owing to the large number of applications for advice and assistance both from Government officials

and from the general public, a certain proportion of the staff is retained in Calcutta throughout the year ; this includes the Curator of the Museum and Laboratory and the Palaeontologist. Geological specimens are determined free of charge ; many hundreds of such determinations, involving numerous qualitative chemical analyses, are made every year. Fire assays and quantitative work are not, as a rule, undertaken for the public, applicants being usually referred either to the Government Test House or to one or other of the numerous professional analysts in India. Information with regard to the mineral resources of the country is given freely, and the greater part of the time of the clerical staff at headquarters is occupied with replies to enquiries of this nature.

Publications.

The Geological Survey of India issues various publications, including—

(1) *Records*, which are published at the rate of approximately one volume of four parts per annum. The *Records* contain the Annual Report of the department, the annual Review of Mineral Production, and papers dealing with both scientific and economic matters. Every fifth year, one volume of the *Records* is devoted to a review of the mineral production of India during the preceding quinquennial period ;

(2) *Memoirs*, which are issued from time to time as material is available ; they are chiefly descriptive, and relate to the geology and mineral resources of areas which constitute more or less well-defined stratigraphical units. They also contain papers in the nature of monographs which are not suitable for publication in the *Records* ;

(3) *Palaeontologia Indica*, published also as material accumulates, and consisting of descriptions of fossils collected during the course of the operations of the department ; and

(4) Miscellaneous publications, such as Bibliographies, Guides, etc., issued from time to time.

Geological galleries.

The geological collections, most of which are housed in the geological section of the Indian Museum comprise some 28,000 specimens of rocks, 9,000 of minerals, and 35,000 of fossils, of which over 14,000 are types. There are four geological galleries in the Museum—

(*a*) the Mineral Gallery containing a large collection of both Indian and foreign minerals, a complete collection of Indian minerals of economic value, and a representative collection of Indian rocks ;

(*b*) the Meteorite Gallery, in which is a fine collection of meteorites comprising 85 Indian and 318 foreign falls ;

(*c*) the Siwalik Gallery containing a collection of Tertiary mammals; and

(*d*) the Palaeontological Gallery, in which are invertebrate fossils and Gondwana plants.

The galleries are open to the public free of charge daily from 10 A.M. to 4 P.M. except Thursday, during the afternoon of which day they are

reserved for Indian ladies, and Friday, on which day a fee of four annas is charged. A member of the staff of the Geological Museum is placed at the disposal of visitors on one of the free days in each week to act as a guide to the collections. Arrangements are also made for students to have ready access to them.

Library.

The library of the Geological Survey of India is probably the finest scientific library in the East; it contains 30,000 volumes, including a very complete set of scientific serials, most of the latter being obtained by exchange of publications with learned societies and other scientific institutions. Free access to the library is allowed during office hours, and every facility is given to persons wishing to consult geological literature.

The Department of Mines.

Activities.

The Department of Mines in India came into existence in 1902. It is mainly responsible for the administration of two Acts, *viz.*, the Indian Mines Act (Act VIII of 1901), and the Land Acquisition Mines Act (Act XVIII of 1885). Under the first Act it is concerned with the safety of mining employees, both in coal mines and in mines other than coal, throughout British India and Burma. Rules have been made under the Act to provide for greater safety and for effective management, and, apart from the rules, the Inspectors have powers to call upon mine owners to remedy dangers and to forbid the employment of women and children in any mine in which they consider it unsafe for them to work. The majority of the fatal accidents are inquired into and reported upon. Under the second Act, the work of which is confined to Bengal and Bihar and Orissa, the officers of the Department act as Mining Advisers to the Local Government, with reference to the support which should be left under railways and with reference to what protective works should be carried out if such support is not given. For this purpose a considerable number of surveyors are employed. Even in provinces where the Act does not apply and where the coal under railways is reserved by Government as landlords, in the lease, the services of the Department are from time to time enlisted.

Staff.

The cadre consists of one Chief Inspector, two Inspectors and two junior Inspectors, and as more than three quarters of the work refers to the coalfields of Bengal and of Bihar and Orissa the headquarters of the Department have been, since 1909, at Dhanbad, in the district of Manbhum, in Bihar and Orissa, on the edge of the Jherria coalfields. For purposes of administration, British India and Burma are divided into two circles with one of the Inspectors in charge of each. One Inspector in charge of No. 1 Circle which includes the Jherria coalfield is stationed at Dhanbad and the other stationed at Sitarampur, in Bengal, is in charge of No. 2 Circle which includes the Ranigunj coalfield. The remaining mines in Bihar and Orissa, all the mines in Assam, the Punjab and Baluchistan are in No. 1 Circle, while those in Bombay, the Central Provinces, Madras and Burma are in No. 2 Circle. Each Inspector has

one junior Inspector to assist him. Since the production of tungsten became of national importance the wolfram mines in the Tavoy district have been under a Superintendent of the Geological Survey, who has been given the powers of an Inspector of Mines, subordinate to the Chief Inspector.

The collection annually of figures of output, labour, etc., from all the mines, and the issue of an annual report is undertaken by the department.

The department has no concern with mines in Native States, but more than one Durbar has asked at various times for the services of an officer in a consulting capacity.

The department is closely associated with mining education. The Chief Inspector is a member of the governing body of Sibpur College, and President of a Board known as the Mining Education Advisory Board under which mining instruction is given in the coalfields of Bengal and of Bihar and Orissa. The two Inspectors are members of this Board and each is the Chairman of Sub-Committees in the coalfields.

The Department of Statistics.

The Department of Statistics was formerly attached to the Finance Department of the Government of India. In 1905 it was placed under the control of the Director-General of Commercial Intelligence, but in 1914 it was once more separated and reorganised. Among the publications for which the Director is responsible are the following annual volumes: Review of the Trade of India, Annual statement of the Foreign Seaborne Trade and Navigation of British India, Prices and Wages in India, Commercial statistics, Financial statistics, Agricultural statistics, estimates of area and yield of the principal crops, and reports on production of Tea and Coal in India. Other compilations are issued quarterly, monthly and fortnightly.

The Patent Office.

The law and procedure in India for the protection of inventions and registration of designs closely follows that in the United Kingdom, the only difference of importance being that in the absence of any legal provision for the registration of Trade Marks, India cannot become a party to the International Convention for the protection of industrial property, under which certain rights of priority are obtainable in other countries.

The Indian Patents and Designs Act, 1911, is in force in British India only (*i.e.*, excluding Native States) and the validity of patents granted under it does not extend to the United Kingdom or any of the British Possessions nor does it permit the registration of trade and property marks or names.

The officer who administers this Act is designated the Controller of Patents and Designs whose office is at 1, Council House Street, Calcutta, and all communications relating to applications for patents and the registration cf designs should be addressed to him. The

Patent Office Hand book (Price, one rupee) contains the Acts, Rules and Instructions.

The Patent office does not undertake to give opinions on the interpretation of patent law or on the advisability of protecting inventions and designs or on their infringement or to recommend any particular agent or assist in the disposal of inventions. Trade and property marks are not registered and there is no provision of law under which medicines are patentable in British India.

The Customs Department.

Administration.

The Customs Department is administered by the Imperial Customs Service, partly recruited in India and partly in England, responsible to the Government of India in the Department of Commerce and Industry. The appointment of Collector to the five principal ports, Calcutta, Bombay, Madras, Rangoon and Karachi is made by the Government of India, three of the Collectorates being reserved for members of the Indian Civil Service temporarily attached to the Imperial Customs Service and two for members of the Imperial Customs Service proper. The subordinate staff at all Custom Houses is provincial and controlled by the Local Governments concerned. At the principal ports the staff consists of Appraisers and Preventive Officers in addition to clerical establishment. An Assistant Collector on the Imperial Service cadre is Collector of Customs, Chittagong. For Customs purposes Aden is not part of British India.

In the Madras Presidency there are a number of minor ports some of quite considerable importance subject to the general control of the Collector of Customs at the Presidency town. For the purposes of further control, the littoral is divided up into circles placed in charge of Inspectors of Customs. The staff of the Customs Department in Madras is one with the Salt and Abkari (*i.e.*, Excise) Department and transfers, appeals and questions of departmental administration are controlled by the Commissioner of Salt and Abkari who is a member of the Board of Revenue. The minor ports in Burma are similarly subject to the control of the Chief Collector in Rangoon who is again subordinate in establishment questions and appeal to the Financial Commissioner. As in Madras the Chief Collector is expected to inspect annually each minor port. The ports in Orissa are staffed by provincial officers and controlled by the Government of Bihar and Orissa and the foreign trade is negligible. The control of the minor ports in the Bombay Presidency proper vests in the Commissioner of Customs, Salt and Excise, while the only two ports open to foreign trade in Sind are under the jurisdiction of the Chief Collector of Customs at Karachi. There is no port in Kathiawar open to foreign trade.

History of the Customs Tariff.

The Customs revenue in India is derived mainly from general import duties which are levied for fiscal purposes and not for the protection of Indian industries. Special import duties are imposed on certain classes of

goods, such as arms and ammunition, salt, liquors, sugar, petroleum and tobacco and export duties on rice, tea, jute, raw and manufactured and hides and skins. The general import duty which was raised to 20 per cent. after the Mutiny, had been reduced to 5 per cent. in 1875, and in 1882 was, except for a few special articles, *viz.*, arms and ammunition, liquors, opium and salt, abolished. Until 1860 there was a general export duty of 3 per cent. *ad valorem*, but by 1875 it was only applicable to oil, rice, indigo and lac. The duty on wheat was abolished in 1873, and the duties on indigo and lac were remitted in 1880, leaving rice as the principal duty-paying export. In addition to import duties at the ports, there existed a wide-spread system of internal duties not only on the frontiers of Native States, but even in British territory. A great barrier, known as the Inland Customs line, stretched from the Indus almost to the Bay of Bengal and was elaborately patrolled, the principal justification being the difference in the rate of salt duty in different parts of the country. But the barrier was also employed to tax sugar. The imposition of a uniform salt duty on the acquisition of the salt sources in Rajputana led to the abandonment of the Inland Customs line in 1879. In 1888 an import duty on petroleum was imposed and in 1894 when the depreciation of the rupee rendered additional taxation necessary, the idea of a general import duty was revived, the rate being until 1916, 5 per cent. *ad valorem*. Cotton was at first exempt when the general duties were again levied, but in December 1894, a 5 per cent. *ad valorem* duty was imposed on imported cotton goods and yarn, while an excise duty of 5 per cent. was imposed on all yarn over of counts above 20 spun in power mills in British India. In February 1896 the cotton duties were again revised, cotton yarn and thread manufactured in India being made free from duty while a uniform 3½ per cent. *ad valorem* rate was imposed on all woven cotton goods whether imported or manufactured in Indian power mills, the products of Indian handlooms being exempted. In 1910-11 the Government, to make good the deficit anticipated from the gradual extinction of the opium trade, raised the duty on silver from 5 per cent. *ad valorem* to 4 annas (4*d.*) per ounce and the duties on tobacco, wine and beer were also increased. Machinery to be worked by manual or animal labour, railway material, gold, food grains, coal, raw cotton, raw wool, cotton twist and yarn, sewing and darning thread, printing materials, and books but not paper were, under the tariff in force until 1916, free of duty.

With effect from 1st March 1916 the tariff schedules were completely recast in order to provide additional revenue to meet the financial disturbances set up by the war. The general tariff rate on imported articles was raised from 5 to 7½ per cent. and export duties imposed on raw and manufactured jute and tea, but the duty on cotton manufactures and silver was not enhanced. The special duties already in force for salt, liquors, cigars and cigarettes, arms and ammunition and petroleum were enhanced, while the following articles were added to the list of goods liable to duty at special rates—sugar and silver manufactures, 10 per cent., coal 8 annas per ton, and manufactured

tobacco, 50 per cent. Iron and steel machinery except for cotton spinning and weaving, railway material, and certain other items (previously on the free list) were charged at 2½ per cent., but books, gold, living animals, raw cotton, raw wool, cotton spinning and weaving machinery, quinine, and certain agricultural instruments continued to be admitted free.

With effect from the 1st March 1917, the policy in force since 1894 was departed from, the import duty on cotton manufactures being enhanced to 7½ per cent. without any corresponding alteration in the excise duty upon the product of Indian power looms which remains at 3½ per cent. An import duty on petrol of six annas per gallon with an equivalent excise duty upon the products of the Burma and Assam oil fields was also imposed for the first time. For a number of articles chargeable with duty a tariff valuation is fixed, which is revised once a year, the tariff schedules as amended appearing generally in the first issue of the *Gazette of India* after the New year. In March 1917, the export duties on jute were doubled and now stand at Rs. 4½ for raw jute per bale of 400 lbs. with a special rate of Re. 1¼ for cuttings and for manufactured jute, Rs. 20 for sacking goods and Rs. 32 per ton hessians. The export duty on tea is Rs. 1½ per 100 lbs. With effect from the 11th September 1919 an export duty has been imposed on all exports of untanned hides and skins of 15 per cent. *ad valorem* with a rebate of 10 per cent. on shipments to the United Kingdom, British Possessions and mandatory territories.

Salt.

The taxation of salt is a legacy from the Moghuls. The excise duty levied on salt manufactured by solar evaporation with the import duty on foreign salt has always furnished a considerable revenue. The rate of duty which is identical is lowered or raised according to fiscal exigencies. At the present time it is Re. 1-4 per maund equivalent to about 1⅞ *d.* a lb. In addition there are large supplies of lake salt and of rock salt mined by Government agency.

About half the indigenous salt is manufactured or mined by Government agency and half under license and excise. The imports usually represent about one-third of the total annual consumption (1,200,000 tons). The rate of duty has varied from time to time. From 1888 to 1903 it was Rs. 2-8 (3*s.*) per maund of 82$\frac{2}{7}$ lbs. (except in Burma which enjoyed a privileged rate) but thereafter was gradually reduced to Re. 1 (1*s.* 4*d.*) in 1907. In 1916 the rate was raised to Re. 1-4 (1*s.* 8*d.*) at which it now stands. The growth of consumption with a lower rate of duty has practically made good the loss of revenue. Though the collection of import duty is effected through the various Customs houses, the amounts so received are credited to a separate head.

Customs revenue.

The Customs revenue collected at the six principal ports and the all-India totals for the last five years are given in the table below. The totals for 1913-14 for all ports were £ 6,246,348 (imports) and £ 858,432 (exports).

TABLE No. 8.—*Customs revenue collected at the six principal ports and totals for British India from 1914-15 (excluding salt).*

Ports.	1914-15.		1915-16.		1916-17.		1917-18.		1918-19.	
	Import duty.	Export duty.	Import duty.	Export duty.	Import duty.	Export duty.	Import duty.	Export duty.	Import duty.	Export duty.
	£	£	£	£	£	£	£	£	£	£
Calcutta	1,829,227	62,625	1,756,850	41,915	2,264,442	984,565	3,072,326	1,477,766	3,294,153	1,678,019
Bombay	2,177,469	17,346	1,848,120	20,564	2,506,443	44,527	2,897,228	68,168	3,133,199	70,604
Madras	392,980	45	317,203	534	476,081	2,405	517,805	1,457	505,401	1,358
Rangoon	413,740	290,546	442,754	275,928	597,327	350,503	575,883	425,685	644,383	447,974
Karachi	452,948	16,327	458,150	21,560	634,747	30,333	808,910	33,246	710,249	22,011
Chittagong	11,519	70	6,916	69	9,310	46,025	6,565	37,903	5,318	60,781
TOTAL FOR ALL INDIA	5,384,258	553,193	4,930,032	526,119	6,613,659	1,647,453	8,011,295	2,216,562	8,356,108	2,453,909

B.—MISCELLANEOUS ITEMS OF LAW AND PRACTICE AFFECTING TRADE

Merchandise Marks.

Importers into India, especially from countries other than the United Kingdom, would do well to make themselves acquainted with the law and regulations relating to merchandise marks. In Appendix II will be found the principal provisions of the Indian Merchandise Marks Act, 1889 and connected Acts and the notifications issued thereunder. The following summary of the regulations in force does not claim to be exhaustive. For those seeking more complete information a reference is suggested to the Merchandise Marks Manual which is published under the authority of the Government of India and obtainable of all agents for the sale of Indian Government publications.

Infringements or offences may be classified conveniently under four heads—

(1) Counterfeit trade marks,

(2) Trade descriptions that are false in respect of the country of origin,

(3) Trade descriptions that are false in other respects, and

(4) Lengths not properly stamped on piecegoods.

(1) Counterfeit trade marks.

The provisions regarding counterfeit trade marks do not cover general get up but do extend to other marks or combination of marks, the imitation of which is reasonably calculated to lead persons to believe that the goods are the manufacture of some person other than they really are, *e.g.*, piecegoods are identified in the bazaar by their labels or by the manufacturer's or importer's number impressed upon them or the merchandise of a particular firm may be known by the firm's name or initials which form no part of the trade mark. These provisions are intended not only to protect manufacturers against piracy, but the general public from being supplied with goods of inferior or unknown quality under cover of a well known brand. If notice of such infringement is given beforehand by the aggrieved party to the Customs authorities, the goods on arrival are detained, if there is reasonable justification, pending (1) execution of an indemnity bond within 24 hours and (2) institution of proper legal proceedings within a month. *Bonâ fide* applications made in the absence of definite information for a watch of possible infringements are usually granted for a period of 3 months renewable on reasonable grounds. But formal registration of marks, etc., by Customs officers is prohibited. If in the course of the ordinary Customs examination an infringement is discovered, intimation is sent to the person whose mark is infringed to enable him to proceed as indicated above, but the goods are released if he fails to take preliminary action within a period of 4 days.

(2) Trade description false in respect of country of origin

It is not necessary to mark the country of origin on any goods imported into India, except where the goods bear some other mark or indication which is held under the regulations to constitute a false trade description with regard to origin, in the absence of any counter-indication of the real country of origin, *e.g.*, Scotch whisky or Jamaica rum, if the produce of Holland. Similarly cognac and sherry require respectively the specific counter-indications 'Not made in France,' 'Not made in Spain,' if not the produce of those countries. The commonest class of cases falling under this description is where the goods bear a mark or label with English words (most frequently the words 'trade mark'), the use of the English language being taken to indicate that the goods are the product of the United Kingdom or British India, and therefore to constitute a false trade description unless corrected by a definite indication of the country of origin (such as 'Made in France') or an indication negativing the implication to be drawn from the use of the English language, such as 'Made Abroad,' 'Not made in the United Kingdom or British India,' 'Foreign Made' or 'Foreign Produce.' When the name used is the name of a place in the United Kingdom or British India a counter-indication is required, *e.g.*, the word 'Boston' requires, in the case of American goods, the counter-indication U. S. A., but 'Made in New York or Philadelphia' does not. The use of the English language on foreign made goods is admissible as part of the goods themselves, *e.g.*, the word 'Stamps' or 'Photographs' on albums but not expressions such as 'A present for a good boy' or 'Superior quality.' A consignment of spelter bearing the words 'Extra pure' on the top of the slabs without counter-indication of country of origin, *viz.*, Japan, which was stamped on the reverse with a rubber stamp, was held liable to penalty.

In the case of goods made or produced in a foreign country, the trade description indicative of origin in the United Kingdom or British India which has been corrected by the use of such an expression as 'Made Abroad' may still be false, if it also suggests that the goods were manufactured in a foreign country other than the actual country of origin (*e.g.*, scents made in Japan bearing the word 'parfumerie'). The counter-indication, which should be such as to negative both these implications, must either specify the actual country of origin or must run 'Not made in United Kingdom or British India or X' (X being the other foreign country in which the goods might wrongly be supposed to have been manufactured). Similarly the use in a trade description of the language of one foreign country on goods produced in another requires counter-indication of the latter.

When the misleading words or marks consist of what is or purports to be the name or trade mark of a manufacturer, dealer or trader in the United Kingdom or British India, a specific and distinct counter-indication of the country of origin is necessary, *e.g.*, pen-holders of German manufacture bearing the name of a British Indian trader without the country of origin were ordered to be reshipped. Initials are not however

treated as names requiring a counter-indication unless they are likely to suggest the name of a British manufacturer; and an exception is made in the case of coverings or labels made in a foreign country but bearing the name of a British Indian manufacturer or dealer who has imported the coverings or labels for his own goods. Goods made or produced in a foreign country but bearing the name or trade mark of a British Indian dealer or a trade description consisting of Indian vernaculars or numerals or pictorial representations such as Indian deities or emblems must bear a counter-indication which is however waived in the case of goods manufactured in the United Kingdom unless in the latter case there is good ground for considering that the marking conveys the impression of Indian origin. A penalty was imposed in lieu of correct stamping on safety matches made in Sweden bearing the word *Om* in Bengali but without any indication of the country of origin.

Dhootis of English manufacture with the words *Bande Mataram* in Bengali woven along the whole borders with the words 'Manchester' stamped in Bengali only in one place were confiscated subject to redemption and reshipment on payment of a penalty and this decision was upheld in appeal.

It is important to note that whenever an indication of the country of origin is required under the regulations, such indication should be (1) in the same language and character as the name or trade mark or trade description, (2) sufficiently conspicuous and indelible and (3) should be repeated for each application of the mark or description in such a manner that it cannot be removed afterwards.

(3) Other false trade descriptions.

Other false trade descriptions are frequently found on goods in respect of (*a*) their number, quantity, measure, gauge or weight, or (*b*) the material of which they are composed.

The cases under (*a*) usually affect (1) woollen and cotton goods in respect of their measure, size or weight, and (2) packages, boxes or cartons bearing incorrect indications in respect of the quantities contained in them.

Paper wrappers of cotton braids each containing twelve skeins were marked '6 grs. yards' implying that each skein was 72 yards long whereas the actual length of the braids varied from 44 to 51 yards. Deletion of the misleading marking was ordered under penalty.

Offences under (*b*) are held to be committed when the trade description suggests that the article is made of a material superior in quality and value than it really is and as such is likely to deceive the buyer. Iron nails described as 'brass nails' were passed on penalty and deletion of the word 'brass.'

A large number of cases under this head occur in connexion with consignments of white zinc, white and red lead, linseed oil and turpentine which are very frequently imported adulterated. The general rule is that when the percentage of impurity exceeds 5 per cent. (10 per cent. in the case of turpentine) but not 50 per cent., a qualifying description

such as 'adulterated' or 'reduced' is held to be sufficient, but if it exceeds 50 per cent the actual percentage should also be stated. Similarly it has been ruled that condensed milk containing less than 9 per cent. of fat contravenes the regulations unless marked 'prepared from skimmed milk.'

(4) Lengths not properly stamped on piecegoods.

As a general rule the Merchandise Marks Act does not require goods to be stamped or marked, though it insists that any stamps or marks affixed should be correct, but by a special provision piecegoods which are ordinarily sold by length or by the piece must be correctly and properly stamped with the lengths in standard yards. The stamping must be in English numerals accompanied by the word 'yards,' abbreviation 'yds.', though marking in inches may be permitted on cloths of small dimensions and delicate make in accordance with the custom of the trade but in all cases it should be placed conspicuously on the fabric itself so as not to be ordinarily removable. For the purposes of this regulation, piecegoods are defined as including woollen piecegoods of all kinds and certain specified descriptions of cotton goods; the provisions however do not apply to any fabric which comes within the scope of the above definition but is ordinarily sold by the unit or with reference to the number. Pieces of mosquito netting imported without the lengths stamped on them were directed to be stamped under penalty or in the alternative with an enhanced penalty in lieu of stamping.

Registration of Trade Marks.

There is no recognised registration of trade marks in India. The majority of the Chambers of Commerce consider that the introduction under legislative enactment of such a system would seriously affect existing rights of user between firms in India and also between firms in India and abroad. Registration of new trade marks on payment of a fee is made by the Madras and South Indian Chambers of Commerce and as evidence of the date on which the mark or ticket was registered, may be useful in subsequent litigation, though it conveys no legal rights. The Bombay Mill Owners' Association keeps a register of all trade marks in use by members and has a special set of rules governing their registration to which all members upon election agree to conform, in view of the protection afforded by the Association to the trade marks and tickets used by them.

Registration of Partnerships.

The question whether the registration of business partnerships should be made compulsory has been frequently considered during the last half century. The absence of any such measure hampers materially

the development of business between Indian firms and foreign constituents and also restricts the grant of financial accommodation by European banks. In 1908 the Bengal and Bombay Chambers of Commerce prepared draft bills on the subject, but their proposals being unreconcilable the Government of India was not disposed to accept either as the basis for legislation. The main stumbling block to a practical solution of the problem is the joint family system. The Indian Industrial Commission* has recommended that Government of India should take an early opportunity of re-examining the whole question.

Registration of Business Names.

Closely allied to the question of registration of partnerships is that of registration of business names for which there is at present no provision of law in India. A movement to introduce legislation on the lines of the United Kingdom Registration of Business Names Act, 1916 has been initiated by the Madras and Bengal Chambers of Commerce and a draft bill prepared by the former body is now before the Government of India. The object of such legislation will be two-fold, *viz.*, to identify alien interests and by compelling disclosure of assumed names to facilitate, by rendering more precise, commercial transactions. Action would not be aimed at Indians trading under assumed European names, though disclosure of real names would be desirable in the case of Europeans trading under assumed names. As in the case of partnership, difficulties are likely to arise in the enactment of any measure relating to business names out of the joint family system prevalent in India. The Indian Industrial Commission in the course of its sittings examined the question but the evidence placed before it did not justify it in making definite recommendations and the Government of India, as in the case of registration of partnerships, is unwilling to legislate until a general consensus of commercial opinion in favour of it is more clearly established.

* Report of the Indian Industrial Commission, para. 233.

PART IV

COMMERCIAL ORGANISATIONS

The principal non-official organisations connected with trade are the Chambers of Commerce at Calcutta, Bombay, Madras, Rangoon and Karachi and other important centres with a membership except in Bombay, preponderatingly European, though open to Indians also. Closely connected with these and not infrequently employing the same secretariat staff are the associations representing particular branches of trade such as jute mills, cotton mills, etc. The Trades Associations representing the retail traders in the principal cities are scarcely less important bodies, and there are other associations representing general interests of more recent growth such as the Marwari Association in Calcutta, the South Indian Chamber of Commerce in Madras and the Indian Merchants Chamber and Bureau in Bombay which are exclusively Indian in membership. These bodies though they differ from time to time on questions of policy, are in no sense antagonistic to the older associations.

The membership of most of these bodies is confined to the province or city where their headquarters are situated, but they maintain close touch with similar organisations at other trade centres. In the case of jute, which is grown only in Bengal, the associations connected with it are representative of the entire industry.

These Associations and the leading Chambers of Commerce in particular keep the bureaucracy apprised from time to time of the problems affecting commercial development in India and, undoubtedly, perform important functions in focussing un-official opinion and representing commercial sentiment the value of which is reflected in the recognition, varying according to their status and traditions, which they enjoy at the hands of Government. The Bengal and Bombay Chambers of Commerce have the privilege of electing a representative to the Imperial Legislative Council and two and one representatives respectively to the Legislative Councils of their Local Governments. The Madras Chamber elects a representative to the Legislative Council of that Presidency, and the Rangoon Chamber to that of the Lieutenant Governor of Burma. A similar privilege is enjoyed by the Upper India Chamber in respect of the Legislative Council of the United Provinces. The Calcutta, Bombay, Madras, and Rangoon Trades Associations also elect a representative each to the Local Councils. These representatives being non-officials enjoy complete freedom of attitude with regard to any legislation or subject of debate which may come before the councils,

and where the views of the commercial public conflict with those of Government, the widely circulated reports of deliberations give them every publicity. The Chambers are also represented in *quasi*-Government institutions such as Port Commissions while seats are reserved for them on the Improvement Trusts of Calcutta and Bombay and on Municipal Corporations. It is usual for both the Imperial and Provincial Governments to obtain the views of the leading Chambers and commercial associations before embarking upon measures which, howsoever remotely, are likely to affect trade, and every consideration is given to any advice tendered.

London Chamber of Commerce.

The London Chamber of Commerce opened in 1912 an East India Section specially charged with the advocacy in the United Kingdom of questions of commercial interest in India.

The constitution and aims of the principal associations are separately treated in the following paragraphs.

A.—General.

Indian Jute Mills Association, Calcutta.

The Indian Jute Manufacturers' Association was constituted in 1884, the name being altered at a special general meeting in July 1902, to the 'Indian Jute Mills Association,' when the rules of the association, as they now exist, were passed.

The Association started with a membership of 19 which has risen to 46 which embraces all the jute mills on both banks of the Hooghly.

The objects of the Association are to encourage and secure united feeling and action, to collect and classify facts and statistics, to open out new markets, if practicable, to fix points of custom, to standardize contracts, to obtain the removal of grievances, to arbitrate on matters of dispute, to communicate with public authorities or kindred associations, generally to promote and to protect the interests of those engaged in the industry in all matters relating to it, especially in matters touching the interests of the members of the Association, and to do all such other lawful needs as are incidental or conducive to the attainment of the above objects or any of them.

All members owning or managing jute mills or holding a power of attorney to represent them in India are eligible to membership of the Association on payment of the annual subscription in advance, and on signing a copy of the rules and regulations.

The affairs and funds of the Association are managed by a Committee consisting of a Chairman and 4 members who are appointed annually at a general meeting. The Secretary and Assistant Secretary of the Bengal Chamber of Commerce are *ex-officio* Secretary and Assistant Secretary of the Association. The office of the Association is at the Royal Exchange, 2, Clive Street, Calcutta.

The Indian Tea Association, Calcutta, was formed at a meeting of Calcutta tea agency firms in 1881, the objects and duty of the Association being to promote the common interests of all persons concerned in the cultivation of tea in India.

Indian Tea Association.

The Association started with a membership of companies and estate owners representing a planted area of over 103,000 acres, which had increased at the end of 1918 to 478,902 acres. Proprietors and managers of, and agents for, tea estates (including limited companies) are eligible for election as members, all applications being dealt with by the General Committee.

The business and funds of the Association are controlled by a General Committee consisting of 9 firms who are elected annually by the members of the Association. Each of the 9 firms elected nominates a gentleman to represent them on the General Committee, and the General Committee elect their own Chairman and Vice-Chairman. The Secretary and Assistant Secretary of the Bengal Chamber of Commerce are *ex-officio* Secretary and Assistant Secretary of the Association which was affiliated to the Chamber in May 1885.

The Association maintains a scientific department which came into being in the early part of 1900. The scientific department deals with many and varied questions affecting tea cultivation, and undertakes the investigation of problems relating to the manufacture of tea. The European staff of the department consists of a Chief Scientific officer, two Assistant Scientific officers, an Entomologist, and a Mycologist and the results of their investigations are published from time to time in the form of bulletins or monographs.

The headquarters of the Indian Tea Association are at the Royal Exchange Buildings, 2, Clive Street, Calcutta.

The Indian Mining Association (founded in 1892) was the outcome of the activities of a Mining Sub-Committee of the Bengal Chamber of Commerce. The objects of the Association are to protect, by every legitimate means, the interests of those engaged in developing the mining industries of India, to foster those industries, to provide a ready means of arbitration for the settlement of disputes between mining proprietors, and to take part in discussions affecting or having a bearing upon mines, their development or working, and for this purpose to enter into communication with the Government and other public bodies.

Indian Mining Association.

All persons or companies engaged in conducting mining enterprises are eligible to be members of the Association. The Committee are empowered by the rules to appoint honorary members but such members have no voting privileges. The Association originated with a membership of 13 which had increased to 102 at the close of 1918. Practically all the European and a number of Indian coal concerns in Bengal and Bihar and Orissa are members of the Association. The Association enjoys the privilege of nominating a representative to the Legis-

lative Council of His Honour the Lieutenant Governor of Bihar and Orissa.

The headquarters of the Association are at the Royal Exchange Buildings, 2, Clive Street, Calcutta, and its business is conducted by a Committee of 7 members who appoint their own Chairman.

Indian Mining Federation.

This Association was founded in 1913 at the instance of the Indian section of the coal mining industry who felt the necessity for establishing an association of their own for the purpose of aiding and stimulating the development of mining industries in India and for protecting and furthering the commercial interests of all persons engaged therein. Colliery proprietors, their managing agents, and coal merchants are alone eligible to be members of the Federation, and the present membership numbers 241.

The headquarters of the Federation are at 233, Old China Bazar Street, Calcutta, with branches in the Jherria and Barakar coalfields. The affairs are administered by an executive consisting of a Chairman and an Honorary Secretary and a Committee of eleven members, who are elected every year at a general meeting of the Federation and the association is affiliated to the Bengal National Chamber of Commerce.

Mining and Geological Institute of India.

This society was founded in 1906 with the co-operation of the Inspectors of Mines and officers of the Geological Survey with headquarters at Calcutta, in the neighbourhood of which the principal mining interests in India are situated, 'to promote the study of all branches of mining methods and of mineral occurrences in India, with a view to disseminating the information obtained for facilitating the economic development of the mineral industries in the country.'

The annual meeting is held in January in the rooms of the Asiatic Society of Bengal, Park Street, and papers read before the Institute are published from time to time in the form of *Transactions*. The present headquarters are situated in the Civil Engineering College, Sibpur Botanic Gardens.

Wine, Spirits and Beer Association of India.

The Wine, Spirits and Beer Association of India was founded in 1892 with headquarters at the Royal Exchange Buildings, Calcutta, to encourage and secure united feeling and action amongst shippers and importers, to decide points of custom, to arbitrate in matters of dispute, to communicate with public bodies, authorities and kindred associations, to watch the operation of the Excise and Customs laws as they may affect the trade, and generally to promote and protect the interests of persons engaged in the wine, spirit and beer trade of India. The business and affairs of the Association are managed by a General Committee consisting of not more than 12 firms of which six are resident in Calcutta and are appointed annually at the general meeting held during the month of March in each year.

B.—Provincial and Local.

(*i*) CHAMBERS OF COMMERCE.

Bengal Chamber of Commerce.

The Bengal Chamber of Commerce, Calcutta, was instituted, under the name of the Calcutta Chamber of Commerce, in 1834, with 79 members, and was reconstructed, under its present name, in 1853. The membership now exceeds 200. The objects of the Chamber, as defined in the memorandum of association, are, briefly, to promote and protect the trade, commerce, and manufactures of India, and in particular those of Calcutta, to consider commercial questions, legislative and other measures affecting commerce, to arbitrate in the settlement of disputes arising out of commercial transactions between parties desirous of referring such disputes for decision by the Chamber, and generally to take such action as may be conducive to the expansion of trade, commerce and manufacture.

The membership list includes merchants, bankers, shipowners, representatives of commercial, railway, and insurance companies, brokers, and persons engaged in agriculture, mining, and manufacture. Until the recent revival of the activities of the European Association this Chamber was regarded as perhaps the principal mouth piece of the political views of the non-official European community in India. Officials and others indirectly connected with the trade, commerce, or manufactures of Bengal, or who may have rendered distinguished service to the interests represented by the Chamber, may be elected honorary members. The associations recognized by the Chamber include the Indian Jute Mills Association, the Calcutta Wheat and Seed Trade Association, the Indian Tea Association, the Indian Mining Association, the Calcutta Baled Jute Association, the Calcutta Liners' Conference and several others.

The Chamber maintains an arbitration tribunal for the adjustment of trade differences arising between parties carrying on business in Calcutta or elsewhere and submitted to it for settlement, which in 1918 alone disposed of over 800 cases. There is also connected with the Chamber a Licensed Measurers' Department controlled by a special committee, to supervise the weighment and measurement of cargo. This department employs a staff of 172 measurers, with a Superintendent, Deputy Superintendent and six Assistant Superintendents.

The Chamber publishes weekly a sheet called Calcutta Prices Current and other statistical circulars. The direction of the Chamber vests in a President, Vice-President and a Committee of seven who are re-elected annually. The President is usually nominated to fill the seat on the Imperial Legislative Council reserved to the Chamber, and in addition two members are elected to represent the Chamber on the Bengal Legislative Council. A seat is also held by the Indian Mining Association on the Legislative Council of the Lieutenant Governor of Bihar and Orissa. The Chamber has six representatives on the Calcutta Port Trust, four on the Calcutta Municipal Commission, and one on the Calcutta Improvement Trust.

This Chamber, which is the premier institution of the Indian commercial community in Bengal, was founded in 1887. The principal objects of the Chamber are to aid and stimulate the development of commercial and industrial enterprise in Bengal, and to protect the interests of all persons trading therein, to promote unanimity and uniformity of practice amongst the members of the trading community and to represent their views and requirements to the authorities, and to arbitrate, when occasion arises, between parties willing to submit their differences to the decision of the Chamber. The number of members on the roll is 126. Almost all the leading Indian commercial and industrial firms and persons in every branch of the inland and foreign trade in Bengal are members of the Chamber. A considerable portion of the joint stock capital invested in Bengal in banking, insurance, steamer services, cotton mills, etc., is also represented. The Indian Mining Federation, an Association representing the Indian section of the coal trade, having 241 members with 340 collieries in Bengal, Bihar and Orissa, is affiliated to the Chamber.

Bengal National Chamber of Commerce, Calcutta.

The Chamber enjoys the privilege of electing representatives to the Calcutta Port Trust, the Calcutta Improvement Trust and other important bodies.

The headquarters of the Chamber are at Calcutta and its affairs are administered by a Committee consisting of 20 members in addition to the President, Vice-President, Honorary Treasurer and Honorary Secretary, with the help of a paid Assistant Secretary.

Marwari Chamber of Commerce, Calcutta.

This Chamber was established in 1900 with a view to developing and protecting the trade, commerce and manufacture of India, and in particular that of Calcutta, to consider all questions relating thereto and to oppose or promote any legislative enactments relating to commerce in general. The Chamber also acts as a medium of communication with Government who takes its opinion on matters of public benefit. It is not affiliated to any other public or commercial bodies but it undertakes arbitration work between parties willing to abide by its decision.

The number of members on the roll is 1,500.

Bombay Chamber of Commerce.

The Bombay Chamber of Commerce, Bombay, was founded in 1836. To it are affiliated the Bombay Millowners' Association and the Bombay Cotton Trade Association. Its affairs are controlled by a Chairman, Deputy Chairman and Committee of seven. This Chamber has given particular attention to the publication of statistical returns and enjoys special facilities from the Custom House for their preparation. The daily issues include an arrival return and trade return, details of all import and export manifests are published twice a week and current quotations weekly, while the figures of exports and imports (principal articles) by sea, and of movements of piecegoods

and yarn by rail are issued monthly. A Measurement Department is responsible for the measurement of exports in the docks prior to loading and as elsewhere one of the most important functions performed by the Chamber is that of arbitration in commercial disputes.

The Chamber nominates a representative to the Imperial Legislative Council and another to the Bombay Legislative Council. It has two seats on the Bombay Corporation and five and one on the Port Trust and Improvement Trust, respectively. There are two classes of members of the Chamber, namely, Chamber members and Associate members. The number of members of either classes is unlimited. Every member elected previous to the 25th day of March, 1918, is considered a Chamber member. Every person being a British subject engaged or interested in mercantile pursuits is eligible for election either as a Chamber member or as an Associate member. Every person not being a British subject similarly engaged or interested, other than a subject of a State with which the British Empire was at war on the 25th day of March, 1918, is eligible for election as an Associate member only.

On the 1st of January 1919, the total membership of the Bombay Chamber of Commerce amounted to 134. Of these twelve represent banking institutions; six, shipping agencies and companies; three, firms of solicitors; three, railway companies; six, engineers and contractors; and 104, firms engaged in general mercantile business.

Bombay Indian Merchants' Chamber.

The Bombay Indian Merchants' Chamber was established in 1907 to promote and protect the trade, manufactures and commerce of India, and in particular to promote the general commercial interests of the Presidency of Bombay. Jointly with the Bombay Native Piecegoods Merchants' Association the Chamber elects a representative to the Bombay Legislative Council and publishes monthly a journal in Gujarati giving commercial and statistical information. It has not yet taken up either arbitration or measurements. Closely connected with, though not affiliated to, this Chamber are the Grain Merchants' Association and the Hindustani Native Merchants' Association.

Madras Chamber of Commerce.

The Madras Chamber of Commerce was founded in 1836 with a view to watch and protect the interest of trade; to receive and collect information on all matters of mercantile interest bearing upon the removal of grievances and the promotion of common good; to communicate with authorities and with individual parties thereupon; to receive reference on matters of customs or usage in doubt or dispute, deciding on the same and recording the decision made for future reference; and to form by that and other means a code of practice whereby the transaction of business by all engaged in it may be simplified and facilitated.

The number of members on the roll at present is fifty, including the leading firms in Madras, the principal banks and the railways serving the Presidency. The Madras Trades Association and the United Planters' Association of Southern India are represented on the Chamber by

honorary members, and Government officials interested in trade and commerce are also invited to join the Chamber from time to time in a similar capacity.

The Chamber is directly represented (generally by its Chairman) on the Madras Legislative Council, and has in addition three seats on the Corporation of Madras and six on the Madras Port Trust. The Chamber is also represented on the Indian Tea Cess Committee and is affiliated to the British Imperial Council of Commerce, London.

The Chamber undertakes arbitrations and surveys with reference to matters relating to piecegoods and yarns and general disputes and publishes a Price Current and Market Report, tonnage schedules, etc. Trade marks and tickets are registered on application and payment of a fee which differentiates against non-members, provided that no objection is raised when the proposal is circulated. No application is favourably entertained from an Indian firm trading under a European name. Though registration conveys no right which the party registering does not already possess at law, it dates in a way the use of a particular ticket or mark by an individual firm which may have evidential value in the event of subsequent litigation.

The affairs of the Chamber are conducted by a Chairman, a Vice-Chairman and a Committee of five members, with the aid of a Secretary. In addition there are three special sub-committees, *viz.*, a Skins and Hides Sub-Committee, an Imports Sub-Committee, and an Exports Sub-Committee, who deal with matters relating to those particular aspects of trade.

South Indian Chamber of Commerce.

The South Indian Chamber of Commerce (founded in 1909) with a membership exclusively Indian, claims to represent Indian commerce, trade, industries and banking in the city of Madras and the adjoining districts of the Presidency. The objects of the Chamber are identical with those of similar bodies and its affairs are managed by an Executive Committee of twenty-four members and a President and two Vice-Presidents. Two Honorary Secretaries are elected from among the members of the Executive Committee, and there is also a paid Assistant Secretary. There are two classes of members, resident and non-resident. The right of electing two representatives to the Madras Port Trust was accorded to the Chamber by the Madras Port Trust Act Amendment Act, 1915. The City of Madras Municipal Act gives the Chamber the privilege of electing two councillors to the Madras Corporation. The Chamber registers trade marks, surveys goods and undertakes arbitration of disputes. There are about 130 members now on the rolls.

Cocanada Chamber of Commerce.

The Cocanada Chamber of Commerce, established in 1868, has no branches, but more or less represents the European mercantile community of the north-east coast of the Madras Presidency carrying on business in Cocanada and in other parts of the districts of Godavari, Kistna, Vizagapatam, and Ganjam. It is managed by a Committee consisting of a Chairman and two members, appoints arbitrators and

conducts surveys and publishes annually a report of the proceedings of the Chamber and statistical information regarding the trade of Cocanada port.

Godavari Chamber of Commerce, Cocanada.

This Chamber, formerly called the Native Chamber of Commerce, was founded in 1886. All Indian merchants engaged or interested in mercantile pursuits on the Coromandel Coast are eligible for membership. Its present strength is 22.

Tuticorin Chamber of Commerce.

The Tuticorin Chamber of Commerce, founded in 1906, has no branches, but represents the European mercantile community of Tuticorin and neighbourhood.

The affairs of the Chamber are managed by a Committee of three members, one of whom is the Chairman, the executive work being in the hands of the Secretary. The Chamber appoints arbitrators, and collects and classifies, for inclusion in an annual report, statistical and commercial information bearing on the trade interests of the port.

Cochin Chamber of Commerce.

The Cochin Chamber of Commerce (founded in 1857) has no branches but more or less represents the European mercantile community of the West Coast from Mangalore to Quilon. It is managed by a Chairman and Honorary Secretary, appoints arbitrators, and publishes annually a report containing statistical information regarding the trade of the Malabar ports generally.

Karachi Chamber of Commerce.

The Karachi Chamber of Commerce, founded in 1860 on lines similar to those of Bombay, has for its objects the promotion and protection of the general mercantile interest of the province of Sind, 'to communicate with the public authorities, with similar associations in other places and with individuals on all subjects of general mercantile interest,' to collect and classify commercial information and to receive and decide references on matters of usage and custom in dispute. Its affairs are managed by a Chairman, a Vice-Chairman, and a Committee of eight elected annually. The Chamber elects a representative to the Bombay Legislative Council and three representatives on the Karachi Port Trust. The number of members on the roll is 58, and there are seven honorary members.

The Chamber undertakes to nominate European surveyors for the settlement of disputes as to the quality or condition of merchandise and appoints a public measurer to measure pressed bales of cotton, wool, hemp, hides and other merchandise at the port. It also publishes weekly a Price Current and Market Report.

Chittagong Chamber of Commerce.

The Chittagong Chamber of Commerce was founded in 1906 to represent the commercial interests of the European and Indian communities in Eastern Bengal. Its membership includes also the Surma Valley and Assam branches of the Indian Tea Association. The Chamber

elects two members to the Chittagong Port Trust and is represented on the local Municipality.

When requested by the parties, the Chamber appoints arbitrators for the settlement of commercial disputes.

Upper India Chamber of Commerce, Cawnpore.

The Upper India Chamber of Commerce, Cawnpore, was inaugurated in September 1888 and the first general meeting took place in January 1889.

The chief aims and duties of the Chamber are to promote and protect the general commercial and industrial interests of the United Provinces of Agra and Oudh, to encourage friendly feelings and unanimity among manufacturers and merchants on all subjects involving their common good, to act as a medium of communication with Government and to receive references from and to arbitrate between parties willing to abide by the decision of the Chamber.

The Chamber began with a membership of 22 which has now increased to 67. Among the members are included all the railways serving these provinces, the principal banks, and, save for a few small ginning and flour and similar mills, all the power-driven industries of the United Provinces and some in the adjoining provinces. The major portion of the joint stock capital invested in Agra and Oudh is represented on the Chamber and in addition there is a considerable individual membership. It is affiliated to the British Imperial Council of Commerce and to the International Federation of Master Cotton Spinners and Manufacturers' Associations, and is directly represented on the United Provinces Legislative Council. It is also represented on the Provincial Board of Industries, the Provincial Board of Agriculture, the Cawnpore Municipal Board, etc. The Chamber maintains a Tribunal of Arbitration and a Commercial Survey which are freely availed of.

The headquarters of the Chamber are at Cawnpore and its affairs are administered by a Committee of ten, including a President and a Vice-President.

United Provinces Chamber of Commerce.

The United Provinces Chamber of Commerce (founded in 1914) is purely Indian in membership and is intended to protect the interests of Indians engaged in trade or industry in Agra and Oudh.

Punjab Chamber of Commerce, Delhi.

The Punjab Chamber of Commerce, Delhi, (founded in 1905) with local committees at Amritsar and Lahore is concerned with the trade and manufactures of the North-West Frontier Province and Kashmir as well as of the Punjab. The President is usually given the compliment of a seat in the Punjab Legislative Council.

Burma Chamber of Commerce

The Burma Chamber of Commerce is an association of merchants, bankers and shipping concerns, banded together to protect their several interests. It was first established about 1863, but its activities were somewhat desultory until 1877 when trade was confronted with so many

difficulties with regard to trade with Upper Burma, and various export and import problems that a public meeting was held to secure a greater measure of general support. The progress of the Chamber has been continuous ever since. Its membership now comprises all the leading banks and firms in Rangoon ; and to it are affiliated the Rangoon Import Association, the Burma Fire Insurance Association, and the Tavoy Chamber of Mines. It also has a court of expert surveyors and arbitrators whose duty it is to settle commercial disputes, and obviate recourse to legal proceedings.

The Chamber is directly represented on the Burma Legislative Council, the Rangoon Port Trust, the Burma Boiler Commission, etc.

The headquarters of the Chamber are in Rangoon and its affairs are administered by a Committee of ten, including a Chairman and Vice-Chairman.

(*ii*) COMMERCIAL ASSOCIATIONS.

Jute Balers' Association, Calcutta.

The Calcutta Jute Balers' Association, established in 1909 and incorporated in 1918 under the Indian Companies Act, 1913, was founded with the object of providing facilities for Indian jute balers, shippers and traders who are not admitted to the Royal Exchange, to conduct sales, to arrange brokerage and to protect and watch over their commercial interests generally. It collects and circulates statistical information, undertakes arbitration and endeavours to secure uniformity in the rules, regulations and usages governing the jute trade.

The affairs of the Association are managed by a Committee of four members with offices situated at 102, Clive Street, Calcutta.

Marwari Association, Calcutta.

The Marwari Association of Calcutta is a non-political organisation, founded in 1898, with the object of promoting the social, moral and intellectual as well as the commercial well-being of the Marwari community.

The membership of the Association, numbering about 150, consists of the principal Marwari business firms in Calcutta and other prominent men of the same community. Its membership covers all the various branches of trade, both inland and foreign, in which the Marwaris are interested, and its representative character is recognised by Government, its opinion being frequently sought on matters of general public interest and on questions affecting the Marwari community in particular.

The office-bearers of the Association who are annually elected consist of a President, four Vice-Presidents, an Honorary Secretary, an Assistant Secretary, a Treasurer, an Auditor, a Solicitor, and fifteen Committee members.

Calcutta Wheat and Seed Trade Association.

The Calcutta Wheat and Seed Trade Association was formed in 1884 for the regulation of the Calcutta wheat and seed trade, to adjust disputes, and generally to promote and protect the interests of the

trade in Calcutta. The affairs and funds of the Association are managed by a Committee of five members Consisting of a chirman and four members who are elected annually at the general meeting of the Association held in the month of March. The offices are in the Royal Exchange Buildings.

Calcutta Hides and Skins Shippers' Association.

This Association was founded early in 1919 with the object of promoting and protecting the interests of those engaged in the hide and skin trade and of developing the trade in raw hides with the British Empire and the Allies. It also includes in its purview an examination of the proper methods of flaying. preserving and curing of raw hides. Its membership includes all leading shippers in Calcutta and people upcountry shipping through Calcutta agency firms. The membership now numbers 21. It is affiliated to the Bengal Chamber of Commerce and its affairs are administered by a Committee consisting of a Chairman and four officers, the Secretary and Assistant Secretary of the Chamber being *ex-officio* Secretary and Assistant Secretary of the Association. The offices of the Association are situated at the Royal Exchange Buildings, 2, Clive Street, Calcutta.

Bombay Millowners' Association.

The Bombay Millowners' Association (established in 1875) was founded with the object of protecting the interests of millowners and users of steam. water and electric power in India, and the promotion of good relations between the persons and bodies using such power.

The membership is preponderatingly Indian and the affairs of the Association are managed by a Committee of twenty, including a Chairman and Deputy Chairman. The secretariat staff is the same as for the Bombay Chamber of Commerce. The Millowners' Association elects a representative to serve on the Legislative Council of the Governor of Bombay alternately with the Ahmedabad Millowners' Association. It also nominates representatives to the Port Trust, the Improvement Trust and other local bodies of lesser importance. The Association keeps a register of all trade marks in use by members and has a special set of rules governing the registration of such trade marks. All disputes between members in connection with their trade marks have to be submitted to arbitration.

There were on the 1st of January 1919, 100 members of the Association of which one was a silk mill, two were flour mills, six were ginning and pressing factories, two were dye or bleach works and the remainder were cotton spinning or weaving mills.

The Association prepares annually a statement showing the names of all cotton spinning and weaving mills in India, their capital, the total number of spindles and looms in each, the average number of hands employed and the approximate quantity of cotton consumed.

Bombay Cotton Trade Association.

The Bombay Cotton Trade Association was founded in 1876 to adjust disputes between persons engaged in the cotton trade, to secure uniformity in the rules and usages governing the trade, to

disseminate useful information concerning the industry in all markets and generally to promote this particular branch of trade in the city of Bombay. In 1892 the Association was incorporated under the Indian Companies Act with a capital of Rs. 50,000, since increased to Rs. 60,000, and its affairs are managed by a Board of not less than nine or more than twenty Directors. The present Directorate consists of a Chairman, Deputy Chairman, and sixteen members.

Bombay Native Piecegoods Merchants' Association.

This Association, which was founded in the year 1881, has for its objects the promotion of friendly relationship and unity among merchants in the city of Bombay dealing in piecegoods, and thereby to facilitate and protect this particular line of trade. It collects and assorts statistics relating to piecegoods, and, when occasion arises, corresponds with public bodies on matters affecting trade, and also hears and decides disputes referred to it for arbitration. It is affiliated to the Bombay Indian Merchants' Chamber, and, jointly with it, has the right of electing a representative to the Legislative Council of the Governor of Bombay.

The affairs of the Association are vested in a Chairman, Deputy Chairman, two Honorary Joint Secretaries, and a Treasurer.

Grain Merchants' Association, Bombay.

This Association was founded 'to promote the interests of the merchants and to put the grain and seeds trade on a sound footing.' It is an influential body possessing a large membership, and its affairs are administered by a Chairman, Vice-Chairman and two Secretaries.

Ahmedabad Millowners' Association.

The Ahmedabad Millowners' Association was started about the year 1891 with the object of protecting the interests of millowners and users of motive power of any description in Gujarat and Kathiawar and those connected with them and the promotion of good relations between the persons and bodies using such power. The Association represents the chief industrial interests in Gujarat, *viz.*, cotton spinning and weaving, oil and match manufacturing, flour making, brick and tile making, cotton ginning and pressing, power generating, alembic and manufacture of chemicals and drugs, foundries and brass works.

The affairs of the Association are managed by a Committee of ten members, including a President, Vice-President, and two Joint Honorary Secretaries. It elects a representative to serve on the Legislative Council of the Governor of Bombay alternatively with the Bombay Millowners' Association, and also nominates a representative to the Ahmedabad Municipality.

There are on the list 66 members, of which 7 are weaving sheds, 7 spinning mills, 38 spinning and weaving mills, 3 engineering firms, 4 oil mills, 2 flour mills, 1 match factory, 1 alembic and manufacture of chemicals and drugs, 1 magnesia works, 1 brick and tile works and 1 power generating company.

(*iii*) PLANTERS' ASSOCIATIONS.

Bihar Planters' Association.

So far back as 1801 the indigo planters of Bihar formed themselves into an association to facilitate correspondence with Government in the interests of the community, to safeguard those interests and to deal with applications for the settlement of differences between one member and another or between members and the local *zamindars* and ryots. The objects of the Association have remained much the same throughout, though the rules were remodelled in 1837 at the instance of Government and altered in 1877 and 1905.

When the successful exploitation of synthetic indigo had driven many of the planters to cultivate sugar and other crops, it was decided in 1905 to change the name of the Association to the Bihar Planters' Association, Limited. Its membership now comprises about 73 factories and it is managed by a Board of Directors, a Chairman, Vice-Chairman and a General Secretary, who are appointed yearly.

United Planters' Association of Southern India, Coimbatore.

The United Planters' Association of Southern India (Incorporated) was formed as the result of a conference of different District Planters' Associations held in 1893. The first meeting took place in 1894 at Bangalore where the head office was situated until 1919, the registered office being at Madras. The chief objects for which the Association was established were to promote and protect in all parts of the world the interests of the various planting industries carried on in Southern India, the collection and dissemination of statistics and information relating to such industries, and the settlement by arbitration of disputes among its members.

The organisation of the Association has recently been amended, membership being of the different District Planters' Associations like those of Mysore and Wynaad and any company, firm or person who is the proprietor of an estate subscribing to a district association. In addition to a number of individual planters, the membership includes twelve district associations. The control is in the hands of a General Committee of 28 members who work through an executive committee of five.

The activities of the Association include a labour department with six divisional officers and agents throughout Southern India and a scientific department of three European agricultural experts in addition to a large subordinate Indian staff in charge of four experimental stations, to be shortly increased to six. It is affiliated to the London Chamber of Commerce and is represented in London by the South Indian Association. It elects an additional member to the Legislative Council of Fort St. George, Madras, and is represented on the Indian Tea Association, the Indian Tea Cess Committee, and the Chamber of Commerce, Madras.

The headquarters of the Association are at Coimbatore, where the *Planters' Chronicle*, the official organ of the United Planters' Associ-

ation of Southern India, is edited. This paper is published weekly and is distributed free of charge to all planters in Southern India and to various scientific bodies all over the world.

Bengal and Assam.

There are no provincial organisations in Bengal and Assam to represent the tea-planting community outside the Indian Tea Association, but there are five flourishing district associations, namely, the Assam and Surma Valley branches of the Indian Tea Association, the Darjeeling Planters' Association, affiliated to the Indian Tea Association and the Duars and Terai Planters' Associations.

(*iv*) TRADES ASSOCIATIONS.

Calcutta Trades Association.

The chief objects of the Calcutta Trades Association which was founded in 1830 and incorporated under the Indian Companies Act, 1882, are to encourage friendly communications amongst persons engaged in business in Calcutta, especially on subjects involving their common interests, to consider all questions connected with the trade of Calcutta, and to promote or oppose any legislative or other measures affecting such trade : and further to arbitrate in disputes between parties where the assistance of the Association in that manner is sought for.

The present membership of the Association which is confined to firms engaged in retail trade in Calcutta, whether the proprietorship of such firms be vested in an individual, a partnership or a joint-stock company, amounts to 83.

The administration of the affairs of the Association is vested in the Master, the Immediate Past Master, the Treasurer and a Committee consisting of six members elected at the annual general meeting, and six appointed by the Master. All Past Masters are also *ex-officio* members of the Committee, so long as they are members of, or are connected with, subscribing firms. The Secretary is the executive officer of the Association.

The principal officer of the Association, formerly styled President, has, since 1831, been designated Master. In 1834 the Governor General, Lord William Bentinck, acceded to a request contained in a memorial addressed to him that the Association should be recognised as a public body, with authority to address Government when they desired, and had sufficient and reasonable cause for so doing, and under subsequent administrations, the status of the Association has continued to be recognised. The Local Government has not only done the Association the honour of submitting various matters of public importance for its consideration, but has also conferred upon the members the right of nominating a representative to the Legislative Council of the province as well as four seats on the Calcutta Municipal Commission and one on the Calcutta Port Trust.

The registered office of the Association is situated at 34, Dalhousie Square, South.

Bombay Presidency Trades Association.

This Association was founded in 1902 with the object of promoting and safeguarding the interests, general or particular, of the trading community of the Bombay Presidency and also of collecting and distributing such information as may protect members of the Association from loss or damage likely to arise in whatever manner. It undertakes arbitration when called upon to do so, collects debts due to members and acts as trustees on their behalf for the liquidation, by persons indebted, of debts due to them. It keeps a watch over legislative or other measures affecting trade and, when found necessary, addresses Government in that regard. Other functions of the Association are the collection and circulation of statistical information relating to trade and the fixing of holidays to be observed by members.

The affairs of the Association are administered by the Master, the Immediate Past Master, the Treasurer and Secretary, together with a Committee of five persons (exclusive of the *ex-officio* members of the Committee) subject to the control of the Association in general meeting. The Past Masters are *ex-officio* members of the Committee so long as they are members of, or are connected with members of the Association. The present membership amounts to 42, and the offices are situated at No. 1, Gymkhana Chambers, Outram Road, Fort, Bombay.

Madras Trades Association.

The Madras Trades Association, established in 1856 and subsequently ncorporated under the Indian Companies Act, was founded with the object of promoting the interests of the tradin community of Madras, of furthering the adoption of a more healthy system of trade with reference to credit and of obtaining as far as possible accurate information of the position and movements of those dealing with or indebted to its members. It undertakes arbitration when necessary, collects debts due to the members and generally acts as trustee for the liquidation, by persons indebted, of debts due to them. All questions relating to hours of business and the fixing of holidays are deal with by the Association, and in addition it promotes or opposes legislative or other measures affecting trade The present membership of the Association is 32, consisting of both European and Indian firms engaged in trade. The administration of affai s is vested in the members and is controlled by the members in general meeting, the principal officers being the Chairman, the Vice-Chairman, and Treasurer.

The Association has the right of electing a representative to the Legislative Council of the Governor of Madras, 2 Trustees on the Madras Port Trust, and 2 Councillors on the Municipal Corporation.

The registered offices of the Association are situated at Marshalls Road, Egmore, Madras.

Rangoon Trades Association.

The Rangoon Trades Association was founded in the year 1898 with the object of promoting the interests of the trading community of Rangoon and for the general adoption of a healthier system of retail trade with reference to credit. It acts as arbitrator in disputes, collects

debts due to members and acts as trustee for the liquidation, by persons indebted, of debts due to members of the Association. It arranges hours of business and holidays, promotes or opposes any legislative or other measures affecting trade, and collects and circulates trade statistics. Its membership, at present numbering 31, consists of firms engaged in trade in Rangoon whether the proprietorship of such firms be vested in an individual, a partnership, or a joint-stock company. The administration of affairs rests in a President, Vice-President and Treasurer, and a Committee consisting of 6 members elected at the annual general meeting. Past Presidents are *ex-officio* members of the Committee so long as they are members of or are connected with subscribing firms. The Association has the right of electing a representative to the Legislative Council of the Lieutenant Governor of Burma, one member to the Rangoon Municipal Committee, and one to the Port Trust.

The registered office of the Association is situated at No. 70, Phayre Street, Rangoon.

PART V

PRINCIPAL PORTS AND TRADE CENTRES

Though the geographical position of India is favourable for international commerce, the littoral of the peninsula is remarkably deficient in harbours to accommodate vessels of the draught now employed in the carrying trade. The west coast ports from Baluchistan to Cape Comorin, with the exception of Karachi, Bombay, and Mormugao, are practically closed to traffic from the end of May to the beginning of September by the violence of the monsoon, and the east coast is surf-bound and without any natural harbours, though an attempt has been made with some success to convert Madras from an open roadstead into a safe anchorage in all weathers by the construction of sea walls. Calcutta, admirably situated for trade in the rich Gangetic delta, is handicapped not by its distance from the sea but by the bars which tend to form in the Hooghly, and Chittagong, though nearer the sea, suffers in an accentuated form from a similar handicap. Burma is very similarly situated, Rangoon, Moulmein, Bassein, and Tavoy being all on estuaries at some distance from the sea, but the three last named suffer from indifferent internal communications.. As a result of these physical conditions practically six-sevenths of India's foreign trade is concentrated in five ports, Calcutta, Bombay, Rangoon, Madras and Karachi, to name them in order of their importance, of which Bombay and Karachi alone are natural harbours.

These major ports with Chittagong are for administrative purposes placed under the control of bodies styled Port Trusts. These Trusts are composed of Commissioners partly nominated and partly elected, who, subject to the control of the Local or Imperial Government, have certain wide powers vested in them by law to levy dues and taxes in connection with the landing and shipping of goods and to utilize the amounts so realized for the betterment of the amenities of the port.

In the following pages are reviewed the principal features of the different ports beginning with Aden, and after crossing to Karachi following the coastline right round the Peninsula to the southernmost confines of Tenasserim.

Aden.

Aden is situated on a volcanic peninsula at the junction of the gulf of the same name with the Red Sea and the Indian Ocean. Though it is under the political jurisdiction of the Government of Bombay, the Indian Sea Customs Act does not apply and imports into British India are regarded as foreign imports.

The settlement including the island of Perim in the Red Sea, has an area of about 80 sq. miles and a population of 50,000. The port known as Steamer Point has an outer harbour giving a safe anchorage to a number of vessels, while the inner harbour is dredged to a minimum depth of 30 feet and has two berths at which steamers drawing 33 feet can lie. There are no wharves and cargoes are loaded and discharged by lighters and small boats.

A great deal of cargo intended for the adjacent Italian and French colonies, Abyssinia, Arabia, the Soudan, the Persian Gulf, and Mombassa, is unloaded here and similarly produce from these destinations is re-consigned at Aden to destinations in Europe and Asia. The United States rank first among the recipients of exports from this port.

Karachi.

Situation and history.

The port of Karachi in the Province of Sind is situated in latitude 24° 47′ North, longitude 68° 58′ East, and is the nearest port in India to Europe. For about a hundred and fifty years Karachi has been the gate of foreign commerce not only for Sind but also for a great part of North-West India, Baluchistan and Afghanistan ; but the value of its trade at the time of the conquest of Sind in 1843 amounted to no more than £80,000 annually. In 1863, the value had risen to £4,440,000 but this was due to a temporary cause, *viz.*, the effect of the American war on the Indian cotton market, and it was not until after direct rail communication had been established with the Punjab in 1878 that this level was recovered. Though Karachi possesses large railway workshops and three well-equipped modern flour mills, it cannot be regarded as an industrial centre, but it is of importance as the principal market and port of shipment for the surplus produce of North-Western India and as a storage depôt for the manufactures and foreign produce which the hinterland requires in exchange for the raw products sent down. The principal exports are wheat, cotton, barley, oilseeds, wool, hides and skins and animal bones (bone meal, bone-dust, etc.), and the principal imports, cotton and woollen piecegoods, sugar, iron and steel, kerosene oil and coal and coke (largely on Government account for the North Western Railway).

Railway connections.

The present population of Karachi is estimated at between 175,000 and 200,000. The only railway line directly serving Karachi is the North Western Railway (broad gauge) which runs on the right bank of the Indus to Sukkur and Quetta and on the left bank to Lahore *viâ* Hyderabad (Sind) and Rohri. At Hyderabad the narrow gauge Jodhpur-Bikaner Railway connects with the North Western Railway The interior of Sind is tapped by a few small feeder railways on the narrow gauge constructed and managed by Messrs. Forbes Forbes Campbell and Co. of Karachi.

Facilities of the port.

The present facilities of the port include a continuous line of wharfage 8,600 feet in length with seventeen ship berths in line, and one coasting steamer berth completely served by railway, with eighty-seven 35-cwt., one 14-ton, and one 30-ton cranes and one 14-ton crane at a separate pier served by railway to take heavy lifts from lighters. In addition there are moorings in the stream for 20 ocean-going steamers, and anchorage for innumerable country craft apart from a boat-wharf, 1,824 feet in length, specially devoted to this trade. Other amenities include a bulk oil pier at which liquid fuel and petroleum are discharged by pipes direct into the bulk oil installations of the various oil companies, a boat basin, an export yard, a produce yard now largely used as a supplementary export yard, and an import yard.

Port Trust.

The affairs of the port were, before the formation of a Harbour Board in 1873, managed under the orders of the Commissioner in Sind and other officers. In 1886 the Port Trust was created by the passing of the Karachi Port Trust Act (Bombay Act VI of 1886), and the newly constituted body held its first meeting in April 1887. The Chairman, practically *ex-officio*, was the Collector of Karachi, and four of the eight members were elected by the Chamber of Commerce and Municipality and the remainder nominated by Government. In 1902 the number of Trustees was increased to eleven, and in 1909 Government agreed to the appointment of a full-time Chairman.

Since 1907 Karachi has been recognised as a first class port and is the headquarters of a Collector of the Imperial Customs Service, with two Assistant Collectors. The new offices of the Port Trust completed early in 1916 cost about £57,000, but were almost immediately afterwards transferred to the Military Department for use as a Base Hospital for the period of the war.

Trade of the port.

The value of the foreign and coasting trade of the port in private and Government merchandize and the revenue and expenditure of the Port Trust taken at intervals of five years will show how Karachi has developed particularly during the last fifteen years.

TABLE No. 9.—*Value of the trade of the port of Karachi and the revenue and expenditure of the Port Trust over a series of years.*

Year.	Import.	Export.	TOTAL.	Revenue.	Expenditure.
	£	£	£	£	£
1887-88	4,124,089	2,721,125	6,845,214	30,913	34,077
1892-93	4,667,546	3,709,889	8,377,435	43,104	55,601
1897-98	5,807,159	4,848,020	10,655,179	60,261	59,856
1902-03	7,732,099	6,947,015	14,612,448	103,661	86,519
1907-08	14,440,125	7,428,422	21,868,548	213,665	176,351
1912-13	16,603,225	24,680,847	41,217,406	371,117	256,774
1913-14	17,743,844	19,782,049	37,525,893	328,729	267,045
1914-15	14,080,954	15,596,248	29,477,202	237,118	264,309
1915-16	13,866,704	15,401,851	29,268,555	229,126	260,812
1916-17	13,906,468	19,139,424	33,045,958	311,123	266,247
1917-18	15,357,713	24,559,091	39,916,844	445,131	338,583

In the first three years of the war there was a temporary set-back in the volume both of exports and imports, due chiefly to conditions arising out of the war. The revenue of the Port Trust has been maintained at or near the pre-war level without any surcharges upon either exports or imports, but Port dues, Berth fees, and Cranage fees have been enhanced as the Port Fund is always in deficit and the Berth fees and Cranage fees were insufficient to cover expenses.

The debt of the Port Trust Board on the 31st March 1917 amounted in round figures to £1,740,000, against which may be set immensely valuable property in land and material and reserve funds exceeding £266,660.

Extension scheme.

The new extension scheme originally estimated to cost about £1,800,000 contemplated the present construction of six, and later on, as required, a further ten ship berths on the western side of the ship channel. The scheme included the widening of the ship channel from 600 to 1,200 feet and its deepening so as to permit vessels drawing upto 32 feet at any state of the tide. This scheme, however, is now under revision by the Board owing to the necessity for a deeper channel and longer berths. The Board also propose to deepen the harbour entrance considerably. The construction of a graving dock and the extension of the import yard are also provided for. The execution of this scheme has been delayed by war conditions, but will now be vigorously proceeded with. A portion of the necessary reclamation work has already been done with the aid of a very powerful suction dredger. Much of the land so reclaimed was temporarily lent by the Board to Government as a River Craft Building Yard, in connection with Mesopotamia. It has since been handed back to the Port Trust who are now utilizing it as a stacking area for military stores and have built ten lightering piers for shipping the same. In 1913-14, 978 vessels with a tonnage of 1,661,611 entered and cleared the port with cargoes in the foreign trade.

Minor ports, in Bombay Presidency.

There are two other ports in Sind open to foreign trade, *Keti Bandar* and *Sirganda*, under the jurisdiction of the Principal Collector of Customs, Sind, but neither of them is of sufficient importance to deserve detailed mention. South of Sirganda are *Mandvi*, the chief port of Cutch, and *Dwarka*, a famous place of pilgrimage in an isolated portion of the Baroda State, both ports of call on the Bombay-Karachi sea route. Steamers lie off at some distance of the shore and the traffic is chiefly local. The foreign trade of *Porbander* in Kathiawar was at one time prosperous but it is now chiefly coastwise. The Portuguese port *Diu* on the island of that name on the southernmost extremity of the same peninsula boasts an excellent harbour but its exchanges once considerable with Mozambique, are now completely stagnant. *Surat*, situated 14 miles from the sea with which it is connected by a river, negotiable only by small country craft, was one of the earliest and most important of the East India Company's factories and its trade was very considerable in agricultural produce and cotton, the value of which was estimated in 1801

at over £1 million. A hundred years later this total had contracted to £200,000 and in the last fifteen years the decrease has been even more marked, most of the trade being now transferred to Bombay owing to the linking up of the two ports by the Bombay, Baroda and Central India Railway. South of Surat is *Daman*, the capital of the Portuguese settlement of that name, which has an area of 149 square miles and a population of 47,000. Even after the decline of the Portuguese power in India the volume of shipments of cotton goods made in Gujarat to East Africa was considerable and between 1817 to 1837 there was also an opium traffic flourishing with Macao, but during the last eighty years the foreign trade has dwindled to nothing.

Bombay.

Situation and history.

The port of Bombay which is situated on an island of the same name in latitude 18° 55′ N, longitude 72° 54′ E, owes its importance to its geographical position and to its magnificent natural harbour. As is well known, the island was part of the dowry of Catherine of Braganza, Queen of Charles II, who conferred it for an annual rent of £10 upon the East India Company in 1668. After the conquest of the Deccan 150 years later Bombay became a provincial capital but until the middle of the 19th century it continued little more than a collecting centre for the smaller ports of the west coast and for the relatively small strip of land between the Western Ghats and the sea. A period of progress was initiated by the establishment in 1838 of a regular monthly mail service to England by the overland route across Egypt and twelve years later commenced the work of linking up Bombay by railway with the cotton growing tracts above the Ghats and the wheat fields of the Punjab and the United Provinces. The American Civil War gave Bombay cotton an unparalleled opportunity and, if the reckless speculation which ensued swallowed up many private fortunes, the port itself emerged with its wharves and accommodation greatly increased and improved and its commercial potentialities unimpaired.

TABLE No. 10.—*Total value of the trade of the port of Bombay (foreign and coasting) in private and Government merchandise from 1887-88.*

Year.	Value of imports.	Value of exports.	TOTAL.
	£	£	£
1887-88	32,387,400	29,335,930	61,723,330
1892-93	33,943,000	37,948,530	71,891,530
1897-98	34,850,330	28,889,260	63,739,590
1902-03	38,562,000	39,104,460	77,666,460
1907-08	60,852,330	46,791,000	107,643,330
1912-13	85,471,660	56,922,660	142,394,320
1917-18	79,642,660	70,921,600	150,564,260
1918-19	96,138,860	67,905,200	164,044,060

In spite of the disorganisation caused by plague since 1896 not only to the facilities of the port but also to the local industrial position, the trade of Bombay as the above table indicates, has ever since continued uninterruptedly to expand, and owing perhaps to its greater proximity to Europe and to two theatres of hostilities in the Far East it has suffered to a smaller extent than any other port in India from the adverse conditions created by the war.

Railway and sea connections.

Bombay is connected with Gujarat and Northern India by the Bombay, Baroda and Central India Railway, and with the Deccan, Central India, the Gangetic plain, Calcutta and Madras by the Great Indian Peninsula Railway. Of the raw materials brought down to the port for export, by far the most important is cotton, the other principal items being coal, hides, twist and yarn, grain and seeds, and manganese ore, while bullion, cotton manufactures, hardware, metals, machinery, kerosene oil, sugar and timber are the chief imports. The traffic in and out of Bombay over the railways in 1913-14 was 4,872,000 tons. Bombay has not the advantages possessed by Calcutta in having rich coal fields within two hundred miles or a system of navigable rivers to bring produce down to the port, but on the other hand she boasts a natural harbour directly upon the sea, which, thanks to its situation, is open at all times of the year.

The principal shipping lines calling at Bombay are the same as those of Calcutta. There is also a large pilgrim traffic to the Hedjaz and trade with the Persian Gulf ports in which Indian merchants take a preponderating part. The coasting trade with Karachi, Kathiawar, the Malabar Coast, and Goa is of considerable importance. The number of vessels which entered and cleared in the foreign trade in the year 1913-14 was 1,536 with an aggregate tonnage of 3,837,111.

Shipping facilities.

The harbour is about ten miles long, from north to south, with a general width of from four to six miles, the anchorage for vessels being on the sheltered eastern side of the island. There are three fully equipped wet docks, known respectively as Prince's Dock, Victoria Dock and Alexandra Dock, having a total water area of 104½ acres and a total quayage of nearly 4½ miles; also two dry docks, the newer having a length of 1,000 feet and a width of 100 feet and the other a length of 525 feet and a width of 65½ feet. Over 200 hydraulic cranes with a lifting capacity varying from 30 cwt. to 100 tons are in use in the wet docks. Until comparatively recently the railway connection with the docks was decidedly inadequate and necessitated a double handling of goods. Raw cotton had to be transported by carts from the railway goods termini to the Cotton Green at Colaba and thence to the mills or docks, thus adding to the cost of the raw material. The new schemes inaugurated by the Bombay Port Trust within the last five years provide direct communication between the railways, docks and goods depôts and of extensive storage shed accommodation at Sewri. The eventual transfer of the cotton trade to the new depôt, Sewri, adjacent to the

docks will remove the disadvantage the trade has suffered under while located at the existing Cotton Green.

Trade of the port.

The following table gives a comparison between the years 1913-14 and 1917-18 of the principal items of import and export trade dealt with at the port of Bombay.

TABLE No. 11.—*Quantity of the principal items of import and export at the port of Bombay in 1913-14 and 1917-18.*

IMPORTS.

Quantity. 1913-14.	Particulars of the principal items of trade.	Unit.	Quantity. 1917-18.
42,649,000	Kerosene oil and Liquid Fuel	Gallons	41,482,000
656,000	Coal . . .	Tons	73,000
522,000	Cotton . . .	Packages	568,000
452,000	Piecegoods . .	Bales and Cases	251,000
326,000	Bricks, Tiles, Chunam and Sand.	Tons	272,000
298,000	Grain . . .	,,	207,000
238,000	Iron and Steel . .	,,	33,000
225,000	Sugar . . .	,,	158,000
139,000	Machinery, Boilers and Railway Materials.	,,	23,000
125,000	Hardware . .	Packages	56,000
102,000	Timber . . .	Tons	139,000
96,000	Firewood . . .	,,	88,000
49,000	Twist and Yarn .	Bales	25,000
22,000	Hay and Straw .	Tons	26,000
18,000	State Railway and Civil Stores.	,,	113,000
16,000	Wool . . .	Packages	19,000
12,000	Hardware . .	Tons	6,000

EXPORTS.

Quantity. 1913-14.	Particulars of the principal items of trade.	Unit.	Quantity. 1917-18.
5,267,000	Kerosene oil . .	Gallons	5,126,000
2,195,000	Cotton . . .	Packages	1,867,000
822,000	Seeds . . .	Tons	263,000
612,000	Manganese ore . .	,,	246,000
529,000	Twist and Yarn .	Bales	330,000
451,000	Grain . . .	Tons	604,000
404,000	Hides . . .	Nos.	Tons 12,000
237,000	Piecegoods . .	Bales and Cases	313,000
106,000	Coal . . .	Tons	926,000
51,000	Groundnuts . .	,,	46,000
46,000	Sugar . . .	,,	60,000
31,000	Myrobalans . .	,,	20,000
31,000	Iron . . .	,,	6,000
28,000	Bones . . .	,,	4,000
3,000	Opium . . .	Chests	3,000

The affairs of the port are under the supervision and control of the Bombay Port Trust, a body consisting of a Chairman and sixteen members, nine of whom are nominated by Government, which had its origin in 1862 in a private concern called the Elphinstone Land and Press Company. This Company entered into a contract with Government to provide a hundred acres for the terminus of the Great Indian Peninsula Railway receiving in return the right to reclaim from the sea for its own advantage two hundred and fifty acres fronting its own properties. Developments of the port immediately followed, but the Government, seeing it inadvisable to vest such a monopoly of the harbour front in a private company, decided to buy it out and transfer its properties to the charge of a public trust. In 1869 therefore the rights of the Company were taken over by Government and finally vested in the newly constituted Port Trust in June 1873. In 1879 the Trust was reconstituted by Government on a basis which has remained practically unchanged to the present day. With the opening of the Prince's Dock in 1880, the financial difficulties of the Trust disappeared. The revenue in 1918-19 amounted to £1,284,000 against an expenditure of £1,215,000. The net surplus on the year's working was £69,000 and the total debt of the Trust at the end of the year amounted to £10,204,000.

Port Trust.

Large developments have recently been carried out by the Trust to meet the growing demands of an increasing trade, and four new schemes, the aggregate cost of which is estimated at about £7 millions, have now been practically completed: (1) the construction of one wet and one dry dock; (2) the reclamation from the sea of about 583 acres of land to the north of the Docks to provide goods depôts; (3) the construction of the new Port Trust Railway connecting with the Great Indian Peninsula and Bombay, Baroda and Central India Railways at a point about 6 miles outside the city where it takes over their traffic and distributes it at the various goods depôts or rails it direct into dock as required; (4) a deep water pier at Trousbay for the discharge of bulk oil, with pipe connection to the oil installation at Sewri. The sea wall of the new Alexandra Dock has been extended 1,500 feet on the west to form the new Ballard Pier on which a commodious passenger station has been erected, from and to which the mail trains will shortly run and at which mail passengers will in future land and embark.

Extension schemes.

A new Custom House adjoins this new landing pier at which the mail sorting offices are also accommodated. Part of the new Port Trust Railway was opened for traffic in January 1915 and the main system is now completed. The traffic of the railway has developed steadily since 1915-16 as the revenue receipts of that year, namely, £66,460, rose to £99,600 in 1916-17 and £131,260 in the following year. The total length of the track is over 100 miles. The new docks, railway and goods depôts have all been of inestimable value during the period of war when the facilities they provided were fully made use of for Government requirements.

The revenue and expenditure of the Port Trust taken at intervals of five years are shewn below.

TABLE No. 12.—*Revenue and expenditure of Bombay Port Trust from 1887-88.*

Year.	Receipts.	Expenditure.
	£	£
1887-88	266,860	245,330
1892-93	299,860	310,200
1897-98	306,590	319,730
1902-03	394,000	366,600
1907-08	518,400	436,460
1912-13	592,530	515,130
1917-18	1,166,930	1,041,330
1918-19	1,284,144	1,215,136

Mormugao.

On the Konkan coast south of Bombay there is no port of any size until one reaches Mormugao, though Janjira, Malwan, and Vengurla have between September and May a considerable coasting trade with Bombay. Mormugao situated on the eastern extremity of the peninsula of that name in Portuguese India, about five miles south of Panjim or Nova Goa the capital, is the terminus of the West of India Portuguese Railway. This line was built by an English Company under the guarantee of the Portuguese Government and worked since 1903 by the Madras and Southern Mahratta Railway. The port is also worked by the railway but quay and tonnage dues are credited to the Government of Portuguese India who appoint the Port Officer, Port Health Officer, and Customs Establishment.

Mormugao has developed considerably in recent years as a port.

Port facilities.

A breakwater 1,200 feet long was completed in 1916 to afford shelter against the south-west monsoon and within the sheltered harbour thus created there is a quay wall at right angles capable of berthing several ocean-going steamers. This quay is fitted with 20 cranes including one with a carrying capacity of 40 tons, one of 30, and one of 25 tons and a travelling crane, and there are two dredgers. The port is open all the year round. Apart from the Customs warehouse there are ten sheds, of which nine belong to the railway and one to a private firm. Loading and discharging is done by the railway company whose wagons run alongside the quay. The Bombay tonnage scale applies in the absence of other agreement or charter. Mormugao is a distributing port and her foreign exports consist chiefly of the produce of Mysore and Hyderabad, and the Bombay Deccan, particularly cotton and manganese, but shipments of the latter which formerly went to the United Kingdom have

been practically suspended of recent years owing to lack of freight. Export from Portuguese India are salt, wood to Basra for military purposes, coconuts and areca nuts. The value of the imports and exports during the last five years is shown in the following table.

TABLE No. 13.—*Trade of Mormugao harbour from 1913-14 onwards.*

Year.	Imports.	Exports.
	£	£
1913-14	154,750	52,219
1914-15	166,328	25,623
1915-16	176,955	89,379
1916-17	226,549	61,315
1917-18	157,154	77,236

Mangalore.

To the south of Goa lies the Bombay district of North Kanara with the ports, only open to the coasting trade, of Karwar, Honavar, and Bhatkal, the last-named being close to the frontier of the Madras district of South Kanara. Passing Coondapoor which is a port of call only for steamers on the Bombay-Mangalore run, Mangalore, the district headquarters with a population of 48,000, is reached at the junction of the Gorpur and Netravati rivers, about 130 miles south of Mormugao. It is a tidal port served chiefly by backwater communication with the hinterland. There is a Port Officer and Customs Collector. Mangalore is the north-western terminus of the South Indian Railway. Vessels upto 200 tons can anchor inside the backwater: larger vessels lie about three miles from the shore. There is a small lighthouse. The chief exports to Europe are pepper from neighbouring areas, coffee and sandalwood from Mysore, and tiles, rice, salt fish, dried fruits and fish manures to Ceylon, Goa and the Persian Gulf.

The foreign import trade is negligible but Mangalore is the favourite port on the coast for the Laccadive and Amindivi islanders who bring their coir and other coconut produce there for sale. 114 steamers aggregating 213,420 tons cleared the port in 1913-14.

Tellicherry.

Tellicherry with a population of about 30,000 is situated about 94 miles south of Mangalore and 14 miles south of Cannanore, a town of about the same size with a much smaller foreign trade. Steamers which anchor about two miles off the shore can work at Tellicherry even during the monsoon when all the other ports on the coast are closed, owing to the natural backwater provided by the rocky approaches to the port. A sea-wall of laterite in cement 1,195 feet in length has recently been built to afford protection against erosion and a pier 560 feet in length,

to be provided with four 1-ton and one 5-ton fixed cranes is under construction. Tellicherry is the headquarters of a Port Officer and Customs Collector and is on the Calicut-Mangalore extension of the South Indian Railway. The principal exports are coffee and pepper, which come down by road from estates in Mysore and Coorg, copra, sandalwood, and tea.

128 steamers aggregating 381,146 tons cleared the port in 1913-14.

Mahé.

About five miles south of Tellicherry one enters the small French settlement of Mahé with an area of about five square miles and a population of about 10,000 in charge of a *Chef de Service*. The town itself is picturesquely situated on the slopes of a hill on the southern bank of the Mahé River where it enters the Arabian Sea. There has been no foreign trade for several years except through the adjoining port of Tellicherry.

Calicut.

Calicut, the headquarters of the Malabar District, is some 42 miles south of Tellicherry and about 90 miles north of Cochin. It is 413 miles by rail from Madras, and the headquarters of a Port Officer and Customs Collector and also of an Inspector of Customs subordinate to the Collector of Customs, Madras, who exercises superior control over all the Custom Houses from Mangalore to Cochin. The population is nearly 80,000. The port is practically closed during the south-west monsoon from the beginning of June to the end of August. The sea is very shallow and steamers anchor about three miles from the shore, connection being maintained by lighters and small boats. Native craft of 150 tons and below lie about 800 yards off the shore.

Port facilities.

There are two new piers about $1\frac{3}{4}$ miles apart, each 775 feet long and fitted with eight cranes (two of each set being of five-ton capacity and the remaining six being of one-ton capacity) to facilitate shipment into lighters. The northern pier is opposite to the Custom House, and the southern abuts on the native bazaar. Beypore, seven miles to the south at the mouth of the river of that name, has recently been declared a wharf of Calicut port. It has eight wharves along the river bank and native craft of 150 tons burthen are able to anchor half a mile from the mouth. The lighthouse at Calicut is visible 12 miles out at sea.

The number of steamers clearing the port in 1913-14 was 187, the figures of total tonnage being 567,620.

The principal exports are coir, coir fibre, copra, coffee, tea, pepper, ginger, rubber and fish manure. The foreign import trade which is insignificant consists chiefly of metals, machinery and provisions.

Cochin.

Cochin, situated about 90 miles south of Calicut, is the most important port between Bombay and Colombo, and in the Madras Presidency the value of its trade is only exceeded by that of Madras and Tuticorin. The system of backwaters running parallel with the coast affords cheap transport, and when the natural situation of the port has been fully developed, its position should ensure a very great increase in its trade. Cochin is nearly 300 miles nearer to Aden than Bombay and over 300 miles nearer to Durban.

New harbour scheme.

The Cochin harbour scheme contemplates in the first instance the removal of the bar to provide ocean-going steamers with access at all tides and in all weather conditions to the inner harbour where anchorage accommodation will be found for fifteen such vessels. It has been calculated that the initial expenditure on this programme will not exceed £83,300 with £16,660 recurring charges chiefly in dredging, which will be more than secured by the increased port and shipping dues anticipated and the further development of the port can take place as funds permit and opportunity offers. The railway programme contemplated includes narrow gauge lines from Trichur to Palghat and Shoranur to Manantoddy and an extension of the Cochin State Forest tramway into the British Anamalais which will tend to strengthen the position of Cochin as the principal outlet for the rubber, tea and timber trade of the hinterland. If the bar across the entrance can be permanently removed, steamers will be able to enter a fine natural harbour which at present is closed to vessels over 600 tons and, with the development which would follow, would undoubtedly make a bid for a larger share of the trade which goes at present to Coromandel ports.

Present port facilities.

Steamers now anchor in the roads about 2½ miles from the wharves and while business at the port is practically at a standstill from the end of May until the middle of August when the trade in coconut produce is slack, cargo can be worked when required owing to the protection afforded by the Maliapuram sandbank three miles to the north. Launches tow the cargo boats to and from the steamers. A new Custom House has lately been opened with wharves designed to carry seven cranes. The Customs and Port offices and principal business houses occupy the foreshore of British Cochin, while the railway serving the port has its terminus at Ernakulam, the capital of the Native State of Cochin, on the eastern side of the backwater about two and a quarter miles away.

Customs arrangements.

By the Interportal Convention of 1865, the Cochin Darbar agreed to abolish the tobacco monopoly and inland transit duties and to equalize the rates of Customs duties at its ports with those in force at British Indian ports as well as to sell salt within its limits at prices ruling in the adjoining district of Malabar. In return for these concessions, the British

Government guaranteed a minimum customs and tobacco revenue of £7,360. As there are no ports in the State open to foreign trade and as the Customs revenue has gone up very considerably at Cochin in recent years, this subsidy has lately been increased. The exports from Cochin consist chiefly of coir, copra, coconut oil, tea and rubber, and the groundnut trade has great potentialities when the railway communications have been improved, as the area under this crop in the adjoining districts is steadily increasing. The port is the headquarters of a Port Officer and Customs Collector. The population of British Cochin is 20,000 and of Ernakulam 21,000.

The number of steamers clearing the port in 1913-14 was 225, their aggregate tonnage being 715,313.

Proceeding further south, the coast line for about 200 miles is that of Travancore.

By the Interportal Convention of 1865 the Travancore Darbar agreed to apply at all its seaports the tariff in force from time to time at ports in British India. The duty on salt is enhanced or reduced in accordance with the rates current in British India. Tea on which export duty has been levied at a land Customs station in Travancore is exempt from export duty on shipment at a Cochin or other British Indian port and revenue realised on foreign produce imported at British Indian port for re-export to Travancore is credited to the State.

Alleppey.

Alleppey, the premier port in Travancore with a population of 25,000, is situated about 50 miles north of Quilon and 35 miles south of Cochin. A canal connects the port with the interior backwaters. It is a convenient depôt for the storage and disposal of all fresh produce and possesses a harbour affording safe anchorage during the greater part of the year. A mud bank in the roadstead acts as a natural breakwater against the force of the roughest seas. Shipping with an annual tonnage of 280,585 (steamers 260,000 tons: sailing vessels 20,585 tons) touch at the port.

The chief exports are copra, coconuts, coir fibre and matting, cardamoms, ginger and pepper. The port possesses a lighthouse and pier, and a tramway worked by coolies conveys goods from the latter to the warehouses.

Quilon.

Quilon, which is connected with Alleppey by backwater, is on the Shencottah-Quilon-Trivandrum branch of the South Indian Railway constructed at the cost of the Travancore Darbar. Vessels anchor about ¾ mile from the shore and a railway siding runs up to the landing place. The chief exports are coconut oil, coir mats, timber and fish, but the foreign trade is small.

Tuticorin.

After rounding Cape Comorin, the southernmost point of the penin sula, one enters again the Madras Presidency and reaches Tuticorin. This port, which is open all the year round, with a population exceeding 40,000 has next to Madras the largest trade in Southern India. It is the headquarters of a Port Officer and of a Customs Collector, and is the south-eastern terminus of the South Indian Railway. An Inspector of Customs, who controls in addition to the Tuticorin Customs the minor ports of Kayalpatnam and Kulasekharapatnam, is also stationed here.

Port facilities.

The harbour is so shallow that steamers anchor about five miles from the shore and continuous dredging is necessary to keep the channel open between the shore and the roadstead. At the same time Hare Island upon which the lighthouse is situated affords considerable protection to the lighters and other craft used for landing and shipping and work is seldom interrupted by the weather. The port is equipped with two piers. The South Indian Railway runs alongside the landing and shipping wharves from which passengers and goods can be transhipped to launches and lighters. About £24 000 has been spent since 1911-12 in affording increased facilities for the landing, shipping, storing and clearing of goods. These improvements include a new pier, a new Customs goods shed, new trolly lines, and a shed for storing combustibles and reclamations along the foreshore for stacking goods.

Improvement scheme.

An improvement scheme calculated to cost £686,000 approximately is under consideration, the idea being to dredge a channel between Hare Island and Ponnayuddee Island and so convert Tuticorin into a deep water harbour capable of accommodating simultaneously seven of the largest sea-going steamers at the wharfsides.

Passenger traffic to and from Ceylon has largely been diverted upon the opening of the Dhanushkodi route but the volume of goods traffic is not likely to be affected when the temporary hindrances to its expansion due to the war have disappeared.

There is a very considerable trade with Ceylon in rice, pulses, onions, chillies and livestock for consumption in that island. Other chief articles of export are raw cotton (to Japan, the United Kingdom and, prior to the war, Germany), tea, coffee, senna leaves and palmyra fibre. The number of steamers that cleared from the port in 1913-14 was 526, the total tonnage being 1,183,736. The value of the foreign trade in 1913-14 was £6,592,000, of which more than £4,500,000 was export trade.

Dhanushkodi.

Dhanushkodi is the terminus of the South Indian Railway on the south-eastern extremity of the island of Rameswaram, at the junction of the Palk Strait with the Gulf of Manaar and connected

with Talaimanaar *in* Ceylon 21 miles distant by a daily turbine steamer service, the journey being made in about two hours. The port is equipped with two piers. Cargo is loaded direct from the railway trucks on these piers into steamer hatches. The port was only opened in 1913, and is rapidly developing. It is the headquarters of an Inspector of Customs, who also controls the ports of Pamban at the western end of Rameswaram island, Mandapam on the mainland opposite Devipatnam and Tondi. The chief exports are coffee, fish (dry and salted), rice, rubber, tea and cotton piecegoods. The population consists almost entirely of employees of the Railway, Post office and Customs. All business on behalf of shippers is transacted by the South Indian Railway. The number and tonnage of vessels cleared during the last five years, with the value of the export trade, is shewn in the table below.

TABLE NO. 14.—*Number and tonnage of vessels that cleared from Dhanushkodi and the value of its export trade.*

Year.	No.	Tonnage.	Value of export trade.
			£
1913-14	27	7,096	Not avilable.
1914-15	479	121,762	467,200
1915-16	726	171,048	1,474,000
1916-17	683	174,287	1,707,300
1917-18	823	192,582	2,131,700

Negapatam.

The chief port in the Tanjore District is Negapatam, about 13 miles south of Karikal, with a population of 60,000. The harbour is equipped with wharves and other facilities for the landing and shipment of goods and the considerable foreshore to the north is utilised for the storage of timber. Negapatam is the terminus of a branch of the South Indian Railway and a siding runs into the harbour premises. The port is further connected by river and canal with the tobacco growing areas to the south.

Port facilities.

A safe anchorage for steamers is found within two miles of the shore and there is a plentiful supply of boats of from 5 to 12 tons which serve as lighters. The numerous sailing craft which trade between this port and Ceylon anchor about half a mile away. Negapatam is the headquarters of a Port Officer and Customs Collector as well as of an Inspector of Customs whose jurisdiction extends from Nagore on the north to Pudupatnam (a subport of Tondi) on the south, a distance of nearly 100 miles. The harbour is situated at the junction of the Kaduvaiyar river with the sea and the

bar at the mouth cannot be crossed by fully laden boats at low water. Nagore, 5 miles to the north, a great place of pilgrimage for Mahomedans, is a wharf of Negapatam.

Foreign trade.

The Europe mail for the Straits Settlements is railed from Bombay to Negapatam and thence taken to Penang and Singapore by a connecting steamer. The number and aggregate tonnage of the steamers clearing the port during 1913-14 was 243 and 684,310 tons respectively. The principal exports from Negapatam are groundnuts for Europe (chiefly to Marseilles and Trieste prior to the war), and coloured cotton piecegoods, tobacco and fresh vegetables for Penang, Singapore and Colombo, the port being the chief provisioning centre for the *coolies* who are constantly leaving by this route to work on rubber and tea estates in Ceylon and the Federated Malay States.

Karikal.

The French settlement of Karikal, covering an area of 53 square miles and a sea-board of 12 miles with about 60,000 inhabitants, is surrounded except to seaward by the Tanjore District. Karikal, the capital, is situated on the north bank of the river Arasalar about 1½ miles from its mouth. The Administrator is subordinate to the Governor General at Pondicherry. The port boasts a lighthouse 142 feet high and is connected by railway with Peralam. The port is an open roadstead and has no direct trade with France, but there is a considerable rice traffic by country boat with Ceylon and the Straits Settlements.

Cuddalore.

Cuddalore is situated about 15 miles south of Pondicherry with a population of 56,000. Cuddalore Old Town is on the main line of the South Indian Railway from Madras to Tuticorin and is connected with the port by a siding which runs up to the wharves. Steamers anchor about a mile off shore, and the harbour wharves are situated on the western bank of the Uppanar backwater and have lately been provided with a quay wall to facilitate the loading and unloading of cargo boats therefrom. There is a lighthouse on the eastern bank of the backwater. Cuddalore is the headquarters of a Port Officer and Customs Collector with an Inspector of Customs whose jurisdiction extends over the ports of Cuddalore, Porto Novo, Tirumalaivasal and Tranquebar besides *chaukis* and outgates on the Pondicherry and Karikal frontiers. The export trade consists principally of groundnut kernels (chiefly to Marseilles), oil-cake for manurial purposes (to Ceylon and Java) and coloured piecegoods (to the Straits Settlements). The coasting trade consists mainly of groundnut oil, refined sugar from Nellikuppam and pulses. The foreign import trade is negligible.

The number and aggregate tonnage of steamers clearing the port in 1913-14 was 190 and 537,162 respectively.

Proceeding further north the coast-line for fifteen miles is that of Pondicherry.

Pondicherry.

Situation.

Pondicherry, the capital of the French Settlements in India (*Etablissements Françaises aux Indes*) and the residence of the Governor General is situated on the Coromandel Coast, 105 miles south of Madras by road. The roadstead possesses as good an anchorage as is to be found in the Bay of Bengal and a long pier fitted with electric elevators to facilitate the landing and shipment of goods. The town which has a population of 47,000 enjoys a good water supply and is lighted by electricity. Steamers can anchor within two or three hundred yards of the pier.

Trade and industries.

Pondicherry is the centre of the export trade in groundnuts from French territory and the adjoining British districts to Marseilles. The town contains an important iron foundry owned until recently by a firm which also pioneered the nut butter industry in India on a commercial scale. The Standard Oil Co. and the Asiatic Petroleum Co. have bulk oil installations here and there are four spinning and weaving mills in the town, the most important of which is under English management. These mills have 1,622 looms and 73,092 spindles and find employment to 12,000 persons and their productions are shipped chiefly to the French colonies and the Straits Settlements. There is also a factory where bone-meal manure is manufactured for the planters of the Shevaroy Hills and an ice manufactory.

Pondicherry is the headquarters of a British Consul and a Chamber of Commerce has come into existence since the war. The French territory round Pondicherry has an area of approximately 115 square miles and a population in 1915 of over a quarter of a million and the frontier which has a perimeter of about 70 miles is guarded by a cordon of land Customs posts, the principal one being at Pondicherry railway station, as the bulk of the traffic is rail-borne. Pondicherry is connected with the main line of the South Indian Railway by a branch which takes off at Villupuram and is also connected by motor service with Cuddalore fifteen miles to the south.

The principal exports are shelled groundnuts (*arachides décortiqués*) and unshelled groundnuts (*arachides en cosses*), areca nuts, castor oil, chillies, *ghi*, and *guinèes* (blue cloth manufactured locally chiefly for the French colonies in the Far East). There are considerable imports of wines and spirits, which are non-dutiable, cotton, kerosene oil, and gunnies for the groundnut crop. There are no import duties levied at Pondicherry, and special arrangements have been sanctioned to regularize the free transport of articles which are dutiable in British India between one French village and another through intervening British villages. The British Indian rupee is the usual unit of currency,

but the trade statistics are shewn in francs. The combined value of imports into Pondicherry, Karikal and Mahé in 1917 amounted to 13,225,207 francs equivalent to £529,000 and the exports to 20,366,326 francs or £814,653, and the tonnage of vessels entering and clearing the three ports was 405,458. In 1913-14, 182 steamers with an aggregate tonnage of 392,325 cleared from Pondicherry.

Madras.

The next port of importance as one proceeds northwards, for Sadras and Covelong have degenerated into mere fishing villages, is Madras, the capital and chief port of the Presidency of that name, 1,032 miles south-west of Calcutta, which has a population exceeding half a million. Until an artificial harbour was constructed, Madras was an open roadstead with a surf-beaten coast line, communication between ship and shore being effected by *masula* boats and *catamarans*. The present harbour has been formed by two concrete walls projecting into the sea so as to enclose a space of about 200 acres with an entrance from the north-east, within which as many as 15 vessels drawing upto 30 feet can be accommodated.

Wharves and quays.

There are six wharves provided with all modern conveniences for the rapid discharge and loading, alongside each of which one vessel can lie in 26 to 30 feet of water in low tide. Three of the quay berths can be used in all weathers. There are also eight mooring berths inside the harbour, and two berths outside, protected by the north arm of the harbour. A tug of 950 h. p. is available at all hours for assisting in the mooring and unmooring of vessels. Landing and shipping of cargo for vessels at moorings is effected by lighters of 20 to 100 tons capacity. These lighters are discharged and loaded at the wharves. The western face of the harbour has been quayed so that the ships can now lie alongside and work cargo direct out of and into the sheds. There are three other quays connected up by rail with all parts of the harbour for the discharge of case oil and petrol, coal, horses and cattle. Vessels can enter and leave the harbour at all times of the day and night but are ordinarily allowed to enter only during daylight. Oil from bulk oil steamers is pumped ashore direct through the pipes into the merchants' installations.

Cranes.

The west quay is provided with modern hydraulic cranes, capable of working directly into and out of the holds of vessels lying alongside and there are several small one-ton hydraulic cranes between berths for loading or discharging lighters and barges. In addition to these there are ten one-ton and seven two-ton hydraulic cranes at the wharves for lighter working, and several steam cranes of three-ton capacity. The cranes for working heavy lifts consist of one 15-ton gantry crane, and two 33-ton titan cranes.

Other facilities.

The warehouse accommodation covers over 10 acres and includes four transit sheds for the storage of goods in transit between ship and shore and three warehouses

with flat roofs for the convenience of shippers dealing in groundnuts and other staples which ordinarily need be cleaned, dried and graded before shipment from Madras.

There is a nine-acre boat basin which gives the necessary protection in all weathers to all the small craft. It is provided with 1,600 feet of shallow quay walling alongside of which barges and cargo boats can lie and is largely used for the landing and shipping of iron and stone and non-dutiable coastwise cargo. This boat basin also contains a slipway for the repair of vessels of 400 tons. An area has also been reserved in which smaller boats and barges can be built.

There is a two-acre timber pond provided with small jetties and cranes together with all facilities for handling timber for which there is a large storage area. There is also another large quayed pond with cranes, railways, etc., for bar iron.

Railway communications.

The harbour is connected with the broad gauge system of the Madras and Southern Mahratta Railway on one side and the metre gauge system of the South Indian Railway on the other. All the sheds and quays are adequately served by railway sidings so that cargo may be discharged into or out of railway wagons directly by steamers.

Port Trust.

The affairs of the port are administered under the Madras Port Trust Act, 1905 (II of 1905) (as amended up to 1919), by the Madras Port Trust Board consisting of fourteen members, six nominated by Government, four elected by the Madras Chamber of Commerce, two by the South India Chamber of Commerce and two by the Trades Association, and a Chairman. Normally the Government nominees include the Collector of Customs, the Presidency Port Officer, the Superintending Engineer, Madras Circle and the Agents of the Railways working into Madras. The Board also are Conservators of the Port under the Indian Ports Act, with a Royal Indian Marine officer as Deputy Port Conservator.

The value of the foreign and coasting trade of the port in private and Government merchandize and the revenue and expenditure of the Port Trust taken at intervals of five years are shewn below.

TABLE No. 15.—*Value of the trade of the port of Madras and the income and expenditure of the Port Trust over a series of years.*

Year.	Value of imports.	Value of exports.	TOTAL.	Receipts.	Expenditure.
	£	£	£	£	£
1887-88	3,952,414	3,344,362	7,296,777	21,058	15,915
1892-93	4,184,757	3,480,805	7,665,562	30,109	26,428
1897-98	4,789,686	3,783,738	8,573,424	41,712	41,774
1902-03	5,015,249	3,622,794	8,638,044	49,224	38,237
1907-08	7,198,012	4,918,648	12,116,659	70,134	50,219
1912-13	8,438,056	6,004,815	14,442,871	83,025	56,567
1917-18	8,859,774	7,224,478	16,084,252	107,068	81,635
1918-19	9,963,292	8,417,659	18,380,951	131,463	94,529

The debt of the Port Trust Board amounted on 31st March 1919 to £907,509. These loans are being paid off by equated payments at a rate which will amortise the whole of the Trust's debt in 1952.

The continuous development which has marked the last fifteen years is due to the foresight, expert knowledge and administrative ability which Sir Francis Spring, K.C.I.E., who has been Engineer Chairman since 1904, brought to bear on the various problems connected with the port.

Extension schemes.

Proposals for further improvements to cost £333,000 are now before Government and include a large increase in the shed space, the provision of modern portal cranes to work direct from ship's holds, and the construction of an additional ship quay, besides many minor improvements.

Principal imports and exports.

The chief imports into Madras are cotton manufactures, metals and ores, cotton twist and yarn, railway plant and rolling stock, machinery and millwork, sugar, spices, oils, hardware and apparel and the chief exports, seeds, leather, raw cotton, grain and pulse, coffee, tea, cotton manufactures, coir, Bimlipatam jute and spices.

The number of vessels that entered and cleared the port in the foreign trade in 1913-14 was 511 with an aggregate tonnage of 1,182,944.

North of Madras there is no port of importance open to foreign trade until one reaches Masulipatam.

Masulipatam.

Masulipatam, the principal port in the delta of the Kistna river, is now connected by a branch line from Bezwada with the main line from Madras to Calcutta. The railway has a goods siding for traffic which runs along the wharves and facilitates shipment. A Port Officer and Customs Collector are stationed here. The port has few natural advantages. Large vessels cannot anchor within five miles from the shore, and the harbour wharves (five in number) are distant another three miles up a tortuous tidal creek, with a lighthouse near the entrance. Native craft up to about 150 tons can cross the bar at the mouth of this creek at high tide but in foul weather communication between ship and shore is practically suspended. Steamers touch here only occasionally and foreign trade is chiefly by native craft with Ceylon, the principal exports being paddy, rice, gingelly and cotton seeds. The prosperity of the port has never recovered from the cyclone of 1864, when a tidal wave caused a disastrous inundation involving the loss of 30,000 lives. The present population is about 42,000.

In 1913-14, 345 vessels (11 steamers and 334 sailing vessels) cleared with an aggregate tonnage of 44,540.

Cocanada.

About 120 miles to the north of Masulipatam is Cocanada situated on the Godavari delta which in spite of certain disabilities ranks fourth in importance among the ports of the Madras Presidency. Large steamers anchor about seven miles from the shore and service with them is maintained by lighters ranging from 16 to 86 tons, which land their cargo at the numerous small wharves situated near the mouth of the Cocanada canal. Smaller craft can come within three miles, and if not drawing more than five feet can, at certain tides, even reach Cocanada itself. There are 28 jetties and wharves from which goods may be shipped. In spite of constant dredging the greatest difficulty is experienced in keeping the entrance of the canal clear of silt.

Features of port.

Cocanada, with a population of 54,000, is the headquarters of a Port Officer and Customs Collector as well as of an Inspector of Customs whose jurisdiction extends from the port of Gopalpur in the Ganjam district to Kottapatam in Guntur. The European and Indian mercantile communities each boasts a Chamber of Commerce. The principal shipments to Europe are raw cotton to the United Kingdom and France, while rice and paddy go in large quantities to Ceylon and Mauritius. The import trade consists chiefly of kerosene oil from America, unrefined sugar from Java and metals from the United Kingdom. Cocanada is connected by a branch railway running from Samalkota (10 miles distant) with the main line from Madras to Calcutta. There is a station near the wharves and a large shed for the storage of goods awaiting shipment. In 1913-14, 192 steamers with an aggregate tonnage of 496,021 cleared the port.

Vizagapatam.

Vizagapatam, with a population of 43,000, is a port with great potentialities situated at the headquarters of the district of that name about 545 miles south of Calcutta and 105 miles north of Cocanada. Two miles from the port at Waltair is the junction of the Madras and Southern Mahratta with the Bengal Nagpur Railway.

A scheme for the development of a deep water harbour by dredging out a swamp about six square miles in area and widening and deepening at the same time a tidal creek which connects it with the sea is under investigation and the necessary land is about to be acquired. The harbour will be constructed and worked as part of the Bengal Nagpur Railway undertaking, and funds for its construction will be provided in accordance with the terms laid down in their contract with the Secretary of State. Simultaneously it is hoped to extend the area to be served by the port by completion of the branch line already partly constructed from Vizianagaram (a junction some 40 miles north of Vizagapatam of

New harbour schemes.

the Bengal Nagpur Railway) to Raipur in the Central Provinces which will tap an area rich in manganese, cotton and oilseeds. The existing landing and shipping wharves which boast a single big crane, are on the northern side of the tidal creek about three furlongs from its mouth and steamers anchor about a mile from the shore under shelter of bluff and are served by cargo boats of a carrying capacity of about two tons each. Owing to the heavy surf communication with ships in the roads is at times fraught with considerable danger. Vizagapatam is the headquarters of a Port Officer and a Customs Collector and there is a lighthouse. The principal exports are manganese (which in pre-war times went chiefly to Antwerp and Baltimore), myrobalans and molasses and there is considerable cooly traffic at certain seasons with Rangoon. All foreign imports are transhipped at Calcutta or Madras, none being received direct. 164 steamers with a total tonnage of 390,629 cleared the port in 1913-14.

Bimlipatam.

The port of Bimlipatam is 21 miles north of Vizagapatam. A good road connects it with Vizianagram, sixteen miles distant on the Bengal Nagpur Railway and another road with Vizagapatam. Apart from a regular *cooly* traffic with Rangoon for the Burma rice harvest there are considerable exports from Bimlipatam of Bimlipatam jute (*hibiscus cannabinus*), myrobalans, mowra and gingelly seeds. The harbour is an open roadstead and ships lie about a mile off the shore, and loading and unloading is effected by lighters. There are many private *godowns* for storing produce awaiting shipment, but no wharves or cranes. The number of steamers clearing in the last pre-war year was 147 with an aggregate tonnage of 343,876 of which 111 with a tonnage of 249,006 were engaged in the coasting trade. The foreign trade, never considerable, was practically in abeyance while war lasted.

In the Ganjam district the only port deserving mention is Gopalpur, which is situated ten miles from Berhampur on the Bengal Nagpur Railway. There is no foreign trade but steamers engaged in the *cooly* traffic with Rangoon call at certain seasons.

North of Gopalpur the sea-board for 250 miles is that of Orissa, the maritime trade of which is chiefly inter-provincial and the only ports that need mention are Balasore, Chandbali and Cuttack.

Balasore.

Until the opening up of the country after the great famine of 1866, Balasore, situated on the right bank of the Burabalang River and the headquarters of the district of that name, was the only port of which Orissa could boast. It was frequented at that time by vessels with cargoes of rice from Madras and with cowries, then largely used for

currency, from the Laccadives and Maldives. The port is of historical interest as being one of the earliest European settlements in India, factories having been established here in the 17th Century by English, Dutch, French, Danish and Portuguese merchants. The subsequent growth of Calcutta as the chief entrepôt of commerce and the silting up of the river together with the abandonment by Government of its monopoly of the salt trade and manufacture have all contributed to the decline of the trade of the port. Outside coasting trade, its foreign trade is now confined to Ceylon, Mauritius and the Maldives. The chief items of export are rice, dry fish, provisions and spices, while the imports are salt, textiles, metals, mineral oils and tobacco.

Chandbali.

Chandbali situated on the left bank of the Baitarani River is now usurping the place occupied by Balasore as the chief port of the province. It has a large coasting trade with Calcutta and other Indian ports, while its foreign trade is mainly with Ceylon, the Maldives and Mauritius. The exports consist mainly of rice and the imports are cotton twist, piecegoods, kerosene oil, salt and gunny bags. There is in addition a considerable passenger traffic with Calcutta, which is served by steamers of the India General Navigation and Railway Company and of the River Steam Navigation Company. In the statistical returns of maritime trade, Balasore and Chandbali are treated together. The value of their combined trade in 1913-14 was £428,574 and the number of steamers and sailing vessels that cleared in that year was 139 with a tonnage of 31,719.

Cuttack and False Point.

Cuttack with a population of 52,000 is situated 253 miles from Calcutta at the apex of a triangle formed by the Mahanadi and Katjuri rivers. It is on the main line of railway running between Madras and Calcutta and is connected by canal with Chandbali and False Point, and for statistical purposes is identified with the latter. There is a harbour and lighthouse at False Point, the former consisting of an anchorage, land-locked by islands and sandbanks, with two navigable channels inland. The harbour is safe and roomy, the channel properly buoyed and a soft mud bottom prevents injury to vessels running aground. The port is open throughout the year and a Port Officer and an Assistant Superintendent of Customs are stationed here.

The trade of False point is chiefly coastwise but a not inconsiderable export trade is carried on with Colombo and Mauritius in rice and oilseeds. The imports are mainly salt, cotton yarn and twist.

In 1913-14, 25 vessels with a tonnage of 74,224 entered and cleared, while the total value of the trade of the port in that year was £121,200.

Calcutta.

Calcutta, situated in latitude 22° 33′ N., longitude 38° 21′ E. on the river Hooghly with a population, including that of Howrah, of about 1,300.000 is the premier city in India and was until 1911, the Imperial Capital. The port serves the great jute, tea and coal industries, the wheat and seeds traffic of Bihar and the United Provinces and generally the agricultural areas tapped by the main lines of the East Indian, Bengal Nagpur and Eastern Bengal Railways and by the numerous waterways connecting the delta with the interior of Bengal and Assam. The total volume of the rail-borne traffic of Calcutta during the last pre-war year amounted to 10,389,000 tons of which 8.605,000 tons were inwards and 1,784,000 tons outward, while river steamers and country boats brought into Calcutta during the same year an additional 1,126,000 tons.

The growth of the sea-borne trade of the port particularly in the ten years preceding the outbreak of war had been very remarkable and is shewn in the table below giving the volume and value of merchandise imported and exported. To this progress a set-back which is reflected in the same table was caused by the prolongation of hostilities as the situation of the port precluded any military traffic as at Bombay and Karachi from being handled to any considerable extent in mitigation of the effects of the scarcity of private tonnage and of the restrictions imposed upon certain classes of exports and imports, and upon shipment of goods to particular destinations.

TABLE No. 16.—*Total value of the trade of Calcutta in private and Government merchandise from 1887-88.*

Year.	Value of imports.	Value of exports.	TOTAL.
	£	£	£
1887-88	18,233,026	28,263,755	46,496,781
1892-93	18,573,451	31,240,095	49,813,546
1897-98	24,194,556	34,115,694	58,310,250
1902-03	27,206,587	39,222,673	66,429,260
1907-08	44,745,939	52,770,448	97,516,387
1912-13	49,198,270	74,571,532	123,769,802
1913-14	56,548,746	75,000,913	131,549,659
1914-15	47,268,779	52,775,117	100,043,896
1915-16	43,575,434	63,671,836	197,247,270
1916-17	46,211,473	66,787,289	112,998,762
1917-18	47,552,767	62,141,170	109,693,937
1918-19	56,294,737	76,510,900	132,805,637

The gross registered tonnage of vessels entering the port has increased ten-fold in the last fifty years and the number of vessels that entered and cleared from the port with cargoes in the foreign trade in the last pre-war year was 999 of 3 077,199 tons burden. The principal items in the export and import trade and the volume of the traffic are shewn in the following tables. Shipments of coal which had increased from

7,600 tons in 1882-3 to over a million tons in 1906-7 (exclusive of bunker coal and Government stores) fell away thereafter and though there was a temporary recovery in 1910 the total for 1913-14 was only 720,000 tons. The movements of rice are entirely dependent on the character of the season and there are therefore large fluctuations as between different years especially on the import side, *e.g.*, over 611,000 tons were imported in 1914-15 as compared with only 10,000 tons in 1911-12.

TABLE No. 17.—*Quantity of the principal items of import and export in the trade of Calcutta in 1913-14 and 1917-18*

IMPORTS.

Quantity. 1913-14.	Particulars of the principal items of trade.	Unit.	Quantity. 1917-18
		Tons.	
521,000	Salt	,,	292,000
463,000	Iron and Steel	,,	66,000
422,000	Sugar	,,	269,000
400,000	Rice	,,	202,000
181,000	Railway Plant, Government Stores, Rolling stock	,,	3,000
124,000	Timber	,,	89,000
121,000	Cotton piecegoods	,,	59,000
70,000	Molasses	,,	37,000
48,000	Cement	,,	46,000
37,000	Spices	,,	32,000
19,000	Other metals	,,	9,000
12,000	Oilseeds	,,	53,000

EXPORTS.

Quantity. 1913-14.	Particulars of the principal items of trade.	Unit.	Quantity. 1917-18.
		Tons.	
4,056,000	Coal (including bunker coal)	,,	901,000
698,000	Jute, raw	,,	271,000
603,000	Jute manufactures	,,	714,000
347,000	Rice	,,	74,000
226,000	Linseed and other oilseeds	,,	59,000
152,000	Wheat, barley, maize	,,	7,000
96,000	Pulses	,,	42,000
93,000	Tea	,,	120,000
83,000	Pig Iron	,,	50,000
74,000	Manganese ore	,,	178,000
55,000	Hides and Skins	,,	19,000
44,000	Manure	,,	18,000
28,000	Raw cotton	,,	8,000
13,000	Saltpetre	,,	16,000

Administration.

The affairs of the port are administered by a Port Trust founded in 1870 and posseses a preponderating element of elected members unlike the Trusts at othe ports where the nominated members form the majority. The Trust i composed of a Chairman and Vice-Chairman and 14 Commissioners o

whom nine are elected and five appointed by Government. The powers and duties of the Commissioners are prescribed by the Calcutta Port Act III of 1890 but they are also appointed under section 7 of the Indian Port Act to be conservators of the Port of Calcutta and as such have charge of the navigable channels of the river leading to, as well as within the limits of, the port proper.

The pilot service is controlled by Government but the Commissioners discharge the duties of the Port Approaches department and Harbour Master's department under the control of a Deputy Conservator. The income derived by the Port Commissioners has expanded as follows during the last decade but equilibrium has only been maintained during the war by the imposition of surcharges.

TABLE No. 18.—*Income and expenditure of the Port Commissioners from 1909-10.*

Year.	Income.	Expenditure.
	£	£
1909-10	789,101	799,824
1910-11	855,078	854,918
1911-12	904,793	888,028
1912-13	949,754	980,021
1913-14	1,008,562	1,044,097
1914-15	963,356	1,035,989
1915-16	1,062,364	993,800
1916-17	1,048,229	1,042,116
1917-18	1,055,945	1,041,956
1918-19	1,270,568	1,060,962

Extent of the port.

When the Commissioners entered upon their duties in 1870 they took over from Government four jetties and some minor works of improvement of the river bank which formed the foundation of the present inland vessels' wharves. They also leased from Government the Strand Bank lands. Together with these assets they accepted liability for a capital debt of £184,000, including the value (£117,700) of the port block made over to them. In the half century that has elapsed extensive properties on both sides of the river have been acquired by and are now vested in the Port Commissioners. The limits of the port which originally extended only from Cossipore to Garden Reach, a distance of about 9 miles, were extended in 1896 to Budge Budge which is 16 miles below Calcutta in order to include the petroleum depôt at that place. The port includes the jetties which are situated immediately south of Howrah Bridge, the docks at Kidderpore which is practically speaking a suburb of Calcutta, and a number of moorings in the stream where the greater portion of the coasting traffic is dealt with by steamers discharging into and loading direct from boats. The left bank of the river from Cossipore to Kidderpore and the right bank from Messrs. Burn & Co.'s Engineering Works at Howrah down to the Botanical Garden are practically continuous wharves for the discharge of inland steamers and country

boats, and immediately above the Botanical Garden a frontage of 5,000 feet is reserved for timber ponds while further upstream there are a number of bunker coal depôts leased to different concerns with a total river frontage of 2,300 feet and 9 pontoon landing stages.

Port facilities—
(1) Calcutta jetties.

The foreign import trade of the port is dealt with at the jetties, which consist of nine berths with a total river frontage of 4,745 feet but one of these is temporarily out of commission, and another is used by the coasting trade for landing cargoes ex boat. Three of the foreign import berths are provided with double-storeyed sheds and the total areas of all the transit sheds is 579,600 sq. ft. In addition there are warehouses at the jetties having a total floor space of 324,156 sq. ft. where imported goods not immediately required can be stored at package rates or compartments can be hired at monthly rates of rent.

The quays are equipped with 49 fixed and 13 derricking 35-cwt. cranes, with two other derricking cranes of a capacity of 1 ton each and one fixed crane to lift 5 tons. In addition the heavy lift yard at Armenian Ghat is provided with a 30-ton Goliath transporter.

During 1913-14, 1,186,800 tons of goods were landed at the jetties of which 9 per cent. was stored at the jetty warehouses, 67 per cent removed by carts, 22¼ per cent by rail, and the remaining 1¾ per cent by boat.

(2) Kidderpore docks.

The Kidderpore docks were commenced in 1884-85 and the first vessel entered in 1892. For a long time they were used almost exclusively for exports, but latterly imports of rice and sugar have been dealt with and just previous to the outbreak of war, when the jetties became congested, a few steamers with foreign imports were discharged there. There are 18 berths for general produce and 10 coal berths; one of which is provided with Beckett's mechanical loading plant while belt conveyors have recently been installed at a second berth, but require alterations before they can be used to advantage. To six of the general produce berths are attached two-storeyed transit sheds and the total floor space of the eighteen transit sheds amounts to 852,500 sq. ft.

The total traffic shipped or landed by the Port Commissioners at the docks in 1913-14 amounted to over 4,850,000 tons but there was a steady falling off during the war and in 1918-19 only 2,433,650 tons were dealt with.

The 60 ft. lock entrance to the docks will take vessels of 58′ 6″ beam and 510 feet length. The other entrance, 80 ft. in width, by means of which vessels up to 600 feet in length could be got into No. 1 dock, can only be used at slack water and when the rise of the tide is at least 13 feet above datum, and consequently practically the whole traffic of the docks is passed through the other entrance.

There are two graving docks inside the Kidderpore docks for the use of ocean-going steamers, while a third small graving dock situated between the two entrances is reserved for the use of Port Commissioners' vessels.

Adjacent to the Kidderpore docks are the Kantapukur grain and seeds depôt with over one million square feet of shed space, where practically the whole of the wheat and seeds export trade is concentrated and where storage accommodation is found for imports of sugar from Java. On the opposite side of the docks are the hide depôts and the tea warehouse, the former with storage accommodation to the extent of one million square feet of space including a covered area of over 360,000 square feet and the latter with 304,000 square feet of accommodation. The new Tea warehouse of which about one-third has been already erected will eventually give another 283,212 square feet of accommodation. These sheds and warehouses are all owned by the Port Commissioners but a number of industrial trading concerns have rented land from the Commissioners in the immediate neighbourhood of the docks; and there are many indications that the importance of the place as a trade centre will rapidly increase as soon as normal trade conditions are restored.

(3) Petroleum wharf at Budge Budge.

The petroleum depôt at Budge Budge is situated on land belonging to the Port Commissioners and under their control. Each importing company has a separate installation comprising shed accommodation for the storage of oil in tins and cases on the riverside, factory sheds behind, and a back area for the storage of oil in bulk. The total storage capacity of the depôt is in round figures 50 million gallons.

Recently the Tank Storage Company opened a depôt for the storage of petrol in bulk and two tanks with a combined capacity of nearly one million gallons have already been erected, with pipe connections enabling tank steamers to transfer their loads direct into the installations.

(4) Port Trust railway.

The Port Trust Railway runs parallel to the river, behind the jetties and transit sheds from Cossipore to the docks, its function being to connect up the docks and jetties with the three main railway systems serving Calcutta. Incidentally also it carries a certain amount of local traffic such as baled jute from the press-houses north of the Howrah bridge to the docks.

The total length of railway track controlled by the Port Trust Railway, including the lines between Howrah and Shalimar on the right bank of the river is 154 miles with 58 engines and 1,560 covered wagons and open trucks, but a large portion of the traffic is carried in foreign trucks.

(5) River approaches.

The port being separated from the sea by 80 miles of difficult river, highly skilled pilotage is necessary for the entry of vessels for a total distance of about 120 miles. The principal obstacles to navigation are the bars which exist in various parts of the river and which can only be crossed by deep draft ships at or near high water. Considerable improvement of the bars in the upper reaches has been effected in recent years by dredging, and further improvements extending to the bars in the lower reaches may be expected with the extension of the plant now being carried out. The average draft of vessels has been steadily increasing, and in 1917-18, 35 vessels drawing more than 28 feet navigated the river, the deepest draft being 29 feet 10 inches.

A further improvement in the despatch of vessels has recently been effected by the lighting of the river between Saugor and Mud Point. Formerly night navigation above Saugor was not permitted, but now that this restriction has been removed outward bound vessels of deep draft, which have been compelled to wait for nearly high water to cross the bars in the upper reaches, are able to cross the lower bars and proceed to sea on the night flood instead of waiting until the following day.

Extension scheme.

In December 1913 a Committee was appointed by the Government of Bengal to consider the question of the general adequacy of the arrangement of the port of Calcutta for meeting the rapidly increasing demands of trade. The Commitee had before them a comprehensive scheme which had already been drawn up by the Port Commissioners which they adopted almost in its entirety. The view was taken that only a slight extension of the jetties was practicable while the extension of the Kidderpore docks was considered to be neither practicable nor economical as it would involve the construction of another lock entrance. The future expansion of the foreign import trade will therefore have to be met by the construction of new docks and jetties at Garden Reach just below the Kidderpore docks. As the construction of the entrance to the new dock system would involve considerable delay, the Committee recommended the immediate construction of four riverside berths with large two-storeyed transit sheds at Garden Reach above the proposed site for the new entrance so that the urgent demand for additional accommodation might be met. The work was begun but owing to the impossibility of obtaining the necessary materials during the war, only one berth and shed have been completed and the cranes have not yet been obtained. A second shed is nearly finished and the four berths with cranes and everything complete should be brought into commission within another two years. The war also prevented any progress being made with the construction of the new dock entrance, but steps have now been taken to begin this essential portion of the scheme at an early date. As soon as the dock entrance is finished, berths behind can be constructed in the first instance to the number of five and more thereafter as the expansion of trade dictates, as the general scheme provides for more than 40 berths. In consequence of this extension it will be necessary to construct a new railway yard (dock junction) where the dock trains will be taken over from or handed over to the Railways, and a considerable amount of reclamation work has already been done with this end in view. The scheme also provides for the removal by rail of imports landed at the new docks to a town delivery depôt nearer Calcutta. The cost of the first stage of the scheme including 5 berths was roughly estimated at nearly £3 millions but this amount is likely to be considerably exceeded owing to the general increase in prices due to the war.

Chittagong.

The port of Chittagong with a population of 29,000 is situated in latitude 22° 14′ N. and longitude 91° 50′ E., 11 miles from the mouth of

the Kornafuli River in Eastern Bengal. Though it has been a trading centre since the sixteenth century when the Portuguese frequented it, it was not until the Assam Bengal Railway was completed in 1895 that its claim to be regarded as the natural outlet for the trade of Assam and north-eastern Bengal was generally recognised. Jute, the chief article of export, was formerly brought down by water to sea-going sailing vessels moored in the stream, but the tea trade was non-existent and the import trade very small.

Port facilities.

The present amenities of the port consist of four jetties built by and belonging to the railway, which are fitted with four 10-ton and seventeen other cranes. The railway has also constructed seven sheds, three for storage purposes, which will accommodate 88,500 chests of tea, 37,400 bales of jute and 170,000 bags of rice, while the four transit sheds can take 270,000 chests of tea, 74,400 bales of jute and 176,000 bags of rice. Further space is available for the construction, when funds are available, of three more jetties and a proportionate number of additional cranes, storage and transit sheds. The port has provided fixed moorings for seven cargo steamers and swinging buoys for three more. There are also berths for two tank steamers for the oil trade. Chittagong possesses no graving or dry docks at present but there are engineering works at which minor repairs to ships may be effected. There are several ship-building yards in which during the last two years eight or nine sailing brigs have been built. The export trade consists chiefly of jute, tea, rice and paddy. Jute arrives generally ready for shipment by train from Chandpur after being baled there or in Narayanganj, while tea is conveyed from the estate to the nearest station on the Assam Bengal Railway which unloads it directly into transit sheds at the jetties. The foreign import trade consists chiefly of salt, for which special storage accommodation to the extent of about 25,000 tons is provided by Government, railway material, tea garden machinery and galvanised sheets.

Port Trust.

Before the formation of the existing Port Trust the affairs of the port were administered by an officer who held the combined appointment of Port Officer and Collector of Customs. In 1879 these appointments were separated and the Port Commissioners Act of 1887 having come into force in April 1888, the management of the port changed hands though entire control was not made over to the Commissioners until 1st April 1889. The Commissioners were 9 in number, 6 appointed by the Local Government and 3 elected by the same authority in such a way as it might direct, the Commissioner of the Chittagong division being ordinarily appointed the Chairman in addition to his other duties. The Custom House is in charge of an Assistant Collector of the Imperial Customs Service.

Trade of the port.

The value of the trade of the port has expanded considerably in recent years. In 1890 the foreign trade was valued at £1,006,600 and the coasting trade at £1,106,600 : the revenue of the Port Trust being £3,749. The effects of the com-

pletion of the Chittagong-Chandpur section of the Assam Bengal Railway were not immediately operative and the first appreciable advance dates from the opening of traffic of the hill section in 1904 bringing tea gardens into direct communication with the port. The revenue of the Port Trust rose in that year nearly to £8,000 and the value of the total trade, import and export, to £2,746,600. Thereafter progress was steady until hampered by the outbreak of hostilities, the revenue realised by the Trust in 1913-14 being £15,700. The principal sources of revenue till 1904 were Port dues and mooring fees but in that year river dues on goods were introduced at the rate of 2 annas per ton, later on increased, to meet war conditions, to 4 annas in April 1915, and now standing at Re. 1 per ton. In 1912-13 the proceeds of a special duty on exports of jute* were handed over to the Port Trust whose income with these two additional sources of revenue has quadrupled in the last quarter of a century.

Finances.

In common with all the smaller Indian ports the value of the trade of Chittagong and the aggregate tonnage of the steamers entering the port declined considerably in the last two years of the war, but apart from this the financial position of the Chittagong Port Trust is far from satisfactory as it has no reserves or revenue producing expenditure and its income is scarcely sufficient to pay ordinary conservancy charges. There is no surplus from which the interest and sinking fund payments for a loan to be expended on the new works and improvements so urgently required, could possibly be found. Since 1914 the deterioration of the river has given rise to frequent complaints from ship-owners, traders and the railway administration alike, and until the natural disadvantages under which the port at present labours have been removed, the future of Chittagong is uncertain. A single dredger which is scarcely large enough for the need of the port is constantly at work and though jute and tea are both measurement cargo, steamers are liable to be neaped if they leave fully loaded except when the tides are favourable. The view is generally held that unless a considerable sum of money is expended on improvements and the river made permanently navigable for the largest class of ocean-going steamers, the port though it serves a large and prosperous area has no future before it. In 1917 Sir George Buchanan was deputed by the Railway Board to advise them as regards the engineering works and improvements necessary to make the port suitable for accommodating the largest ships and the sum of the expenditure that these works would involve. His proposals excluding the cost of dredgers amounts to £250,000 and there is in his opinion no engineering difficulty in keeping the Kornafuli river permanently open for navigation by the largest ocean-going steamer. The question of the Assam Bengal Railway taking over the port as an integral part of their system is under the consideration of the Government of India.

* In the case of raw jute, two annas per bale of 400 lbs. and in the case of manufactured jute, 12 annas per ton of 2,240 lbs.

The value of the foreign and coasting trade of Chittagong in private merchandize in 1917-18 was as follows. The corresponding figures for 1913-14 were £4,161,000 (foreign) and £1,686,800 (coasting).

TABLE No. 19.—*Value of the foreign and coasting trade of Chittagong in 1917-18.*

Items of trade.	Foreign trade.	Coasting trade.
	£	£
Imports	271,400	1,400,600
Exports	1,532,200	504,700
TOTAL	1,803,600	1,905,300

The number of vessels that entered and cleared the port in the foreign trade in 1913-14 was 617 with an aggregate tonnage of 1,842,490.

There is at present no railway connecting India proper with Burma, but one route *viâ* Chittagong has already been surveyed and an alternative *viâ* the Hukong valley will be surveyed in 1919-20. The shortest sea route is between Chittagong and Akyab.

Akyab.

Akyab, the headquarters of the Arakan Division, and the only port on the western seaboard of Burma of any commercial importance, boasts five public and thirty-five private wharves. The former are fitted with one 5-ton and one 3-ton crane in addition to two hand cranes. It is the headquarters of a Port Officer who is *ex-officio* the Customs Collector and the population exceeds 30,000. There is a jetty for deep sea vessels, which can accommodate ships with a draft of 18 feet but the loading and unloading of cargo is usually carried out in the stream. Akyab has no railway communications but the British India Steam Navigation Company used before the war to run a weekly steamer service from Rangoon to Calcutta and back *viâ* Akyab and Chittagong, calling at two minor ports, Kyaukpyu and Sandoway, between October and April. There is also a launch service owned by the Arakan Flotilla Co., plying between Akyab and other Arakan coast ports, and a large sea-borne trade is carried on by native craft. The principal articles of import are apparel, coal, cordage and rope while the only exports of importance are rice and paddy.

250 steamers with an aggregate tonnage of 294,220 cleared the port in 1913-14.

Bassein.

Bassein, the headquarters of the Irrawaddy Division, with a population of 67,000 is situated nearly seventy miles from the sea and is important only as a rice shipping centre. The main branch of the Bassein River is navigable by vessels of a draught of 27 feet and large quantities of rice are loaded during the season by ocean-going steamers. The import trade is unimportant. There is direct railway communication from Bassein and several river steamer services exist, the most important of which is that run by the Irrawaddy Flotilla Co., with Rangoon. There are five public and twenty private wharves for the landing and shipping of goods but the port at present lacks warehouses and cranes and loading is effected entirely in the stream. The Port Officer is also *ex-officio* the Customs Collector.

68 steamers with a tonnage of 192,860 cleared the port in 1913-14.

Rangoon.

Rangoon, the capital of Burma and the headquarters of the Local Government, with a population of about 300,000, is the chief port of the province of Burma and in the volume and value of its trade the third seaport of British India. It is situated on the Hlaing or Rangoon River about 24 miles from the sea. The only line directly serving Rangoon is the Burma Railway, metre gauge, which connects the capital with Bassein, Henzada, Prome, Moulmein, Mandalay and Myitkyina.

Port facilities.

The present facilities of the port include 3 wharves and 4 pontoon jetties aggregating 3,980 feet in length with 11 berths with depths of from 20 to 26 feet below low water of spring tides for ocean-going steamers and 21 jetties for inland vessels. There are eighteen 3-ton hydraulic cranes and thirteen 35-cwt. hydraulic cranes and one 30-ton sheer legs to take heavy lifts from steamers. There are 23 swinging and 11 fixed moorings in the river for ocean-going steamers, 6 of the latter being reserved for oil tankers. The port lacks a dry dock suitable for ocean-going vessels, but in every other respect is well equipped with modern conveniences for loading and unloading vessels and for the handling and storage of cargo.

In February 1914 an elaborate river training scheme designed and executed by Sir George Buchanan was completed at the cost of £920,000 and the chief disability to the port is the Hastings shoal, which compels a great number of vessels to go below it to complete their loading.

Port Trust.

The affairs of the port are administered by a Trust consisting of thirteen members, eight of whom are nominated by Government, four elected by the Burma Chamber of Commerce and one by the Rangoon Trades Association.

The following table shows the income derived by the Port Commissioners from 1880-81 and the expenditure on the port.

Table No. 20.—*Income and expenditure of the Rangoon Port Trust.*

Year.	Income.	*Expenditure.
	£	£
1880-81	51,629	44,379
1885-86	42,058	36,449
1890-91	70,566	86,104
1895-96	76,524	64,681
1900-01	95,087	92,023
1905-06	127,543	126,458
1910-11	231,099	230,508
1913-14	345,652	246,869
1914-15	302,532	275,322
1915-16	302,512	265,665
1916-17	300,846	259,942
1917-18	275,687	271,680

The debt of the Commissioners for the port of Rangoon on the 31st March 1919 amounted in round figures to £1,990,800 against which may be set immensely valuable property in land and material. There are also reserve funds exceeding £289,000 and a sinking fund exceeding £436,530.

Trade of the port.

The value of the foreign and coasting trade of the port in private and Government merchandize taken at intervals of five years will show how Rangoon has developed during the last 39 years.

Table No. 21.—*Value of the trade of the port of Rangoon from 1880-81.*

Year.	Import.	Export.	Total.
	£	£	£
1880-81	4,120,600	3,695,200	7,815,800
1885-86	4,025,600	3,964,933	7,990,533
1890-91	5,892,533	5,977,866	11,870,399
1895-96	5,765,466	6,752,400	12,517,866
1900-01	7,861,066	11,026,333	18,887,399
1905-06	9,891,400	13,766,933	23,658,333
1910-11	12,013,333	18,559,466	30,572,799
1913-14	16,614,416	20,879,075	37,493,491
1914-15	12,016,432	19,376,888	31,393,320
1915-16	12,541,000	18,260,800	30,801,800
1916-17	14,409,654	21,200,452	35,610,106
1917-18	12,980,133	19,664,200	32,644,333

The foreign sea-borne trade westward is carried principally by vessels of the Bibby, Henderson, and Ellerman's City and Hall lines, while traffic to the Far East is principally in the hands of the British India Steam Navigation Co., the Java Bengal Line and the Nippon Yusen Kaisha.

* Exclusive of payments to reserve fund.

The British India Steam Navigation Co. also enjoy the bulk of the coasting trade and the Irrawaddy Flotilla Co. operating from Rangoon has almost a monopoly of the very considerable river-borne traffic. The headquarters of the railway and of all other large businesses in Burma are in Rangoon, and about 90 per cent. of the foreign trade of the province passes through the port. Of the coasting trade, about 80 per cent. of the trade with other provinces and about 40 per cent. of the inter-portal provincial trades goes through Rangoon. There is a large Chinese trading population in the town and considerable trading is done with the Far East. The principal imports from foreign countries are cotton manufactures, including twist and yarn, metals, provisions and oilman's stores, silk, sugar, salt, machinery and millwork, hardware, etc. Rangoon's chief exports to foreign countries are rice, grain and pulse, paraffin wax, hides and skins, pig lead, cotton, wood and timber, rice bran, rubber, wolfram ore, mineral oils, tobacco and cutch.

In 1913-14 626 vessels entered and cleared from the port with cargoes in the foreign trade with an aggregate tonnage of 1,913,523.

Moulmein.

Moulmein, near the mouth of the Salween River, is the largest of the Tenasserim ports and the headquarters of a Port Officer who is also the Customs Collector. It contains several saw mills and was once the centre of a flourishing ship-building industry, of which there has been a partial revival in the last two years. In pre-war times, the British India Steam Navigation Company used to run steamers three times a week between Rangoon and Moulmein and fortnightly along the Tenasserim coast, and the steamers of the Asiatic Steam Navigation Company also called here. The railway from Rangoon has captured much of the sea-borne trade ; its terminus being at Martaban, on the opposite bank of the Salween and connected with Moulmein by a steamer ferry service. There are also launch services from Moulmein up the Salween, Ataran and Gyaing rivers. There are sixteen public and forty private wharves for the landing and shipping of goods, but no cranes, and steamers use their own winches and donkey engines to lift cargo. Loading is usually done in the stream off Mupun, about three miles below Moulmein town. The principal imports into Moulmein are apparel, coal, coir manufactures and cordage and rope, while the chief exports are rice, rice bran, teak and jungle wood, lac, hides, fishmaws and cigars. The population exceeds 58,000.

263 steamers with a tonnage of 323,377 cleared from the port in 1913-14.

Tavoy.

Tavoy, which is situated about 35 miles from the mouth of the Tavoy River, has lately come into prominence owing to the development,

particularly during the war, of the wolfram and tin mining industries. The population now exceeds 135,000. In addition to one public wharf there are twelve private wharves for the landing and shipping of goods. The Custom House is in charge of the Deputy Commissioner who is *ex-officio* the Customs Collector. A weekly steamer service is maintained by the British India Steam Nagivation Company as far as the mouth of the Tavoy River which is unnavigable for ocean-going steamers, whence a launch conveys passengers and cargo to the town. There is also a fortnightly steamer service between Tavoy and Moulmein. A large proportion of the trade is with the Straits Settlements, Siam and the Far East. The chief imports into Tavoy are apparel, dynamite, carriages and carts, machinery, sheets and plates, provisions and oilman's stores.

Until recently the principal export was rice, but the increased demand for labour in the wolfram mines has caused the cultivator to desert his fields in order to adopt the more lucrative profession of mining. Wolfram and tin ore are the most important exports. Other exports are rubber, fishmaws and shark fins.

233 steamers with an aggregate tonnage of 175,833 cleared from the port in 1913-14.

Mergui.

Mergui is the centre of the Burma rubber and pearl-fishing industry. The area of cultivation under rubber in the district has increased from less than 4,000 acres in 1909 to 21,000 in 1918, on one-third of which tapping has begun. The port possesses two public and four private wharves for the landing and shipping of goods. The Deputy Commissioner, who is in charge of the Custom House is *ex-officio* the Customs Collector. The British India Steam Navigation Company's steamers normally run weekly from Rangoon and there is a fortnightly service from Moulmein. Trade with Penang is carried on by a Chinese steamer which runs irregularly, while native craft carry on a trade with Victoria Point close to the frontier of Siam and the Malay States and other Tenasserim ports. Exporters for the most part use their own jetties.

The import trade is not of much importance. The principal exports are rubber, tin, wolfram and pearls. The total number of steamers that cleared the port in 1913-14 aggregated 206 with a tonnage of 144,570.

Tonnage clearances with cargoes.

The following table shows the tonnage of steamers and sailing vessels that cleared with cargoes from British Indian ports distinguishing British and British Indian from foreign ships during the pre-war quinquennium and in subsequent years.

TABLE No. 22.—*Tonnage of steamers and sailing vessels that cleared with cargoes from British ports from 1909-10 to 1918-19.*

Nationality of the vessels.	Average of 5 years 1909-10 to 1913-14.	1915-16.	1916-17.	1917-18.	1918-19.
	Tons.	Tons.	Tons.	Tons.	Tons.
British ships, including British Indian.	6,069,000	4,930,000	4,801,000	3,875,000	3,531,000
Foreign ships .	1,738,000	892,000	1,089,000	1,500,000	1,552,000
TOTAL .	7,807,000	5,822,000	5,890,000	5,497,000	5,083,000

The nationality of the vessels that cleared during the same periods is shewn separately in the next table. More frequent arrivals of Japanese and Dutch steamers have filled the gap caused by the disappearance of Germany and Austria, but have only partially made good the great fall in the number of British vessels calling at Indian ports. The vessels flying the flag of the Chinese Republic are nearly all sailing ships engaged in trade with Burma ports.

TABLE No. 23.—*Nationality of vessels cleared with cargoes from 1909-10 to 1918-19.*

Nationality.	Pre-war average No. of vessels.	1915-16 No. of vessels.	1916-17 No. of vessels.	1917-18 No. of vessels.	1918-19 No. of vessels.
British* . .	2,593	2,734	2,754	2,432	2,103
German . .	225	...	...	...	..
Austro-Hungarian	119	...	...	...	...
Japanese . .	62	137	193	241	308
Norwegian . .	53	83	129	97	68
Dutch . .	39	59	100	107	71
Italian . .	36	42	41	94	44
French . .	28	3	1	24	20
Russian . .	13	20	18	8	23
Greek . .	5	13	15	57	23
Swedish . .	4	15	27	21	17
American . .	...	6	8	8	25
Chinese . .	...	2	7	49	70
Other nationalities	9	3	2	35	27
TOTAL .	3,186	3,120	3,295	3,173	2,799

* Including steamers registered in British India.

Principal trade centres.

India's foreign trade is to a great extent centred in the five principal ports but though the population is chiefly rural, there are a considerable number of towns in the interior which deserve mention either as distributing or industrial centres. Calcutta is of importance from the latter point of view as the centre of the jute manufacturing industry, all the jute mills in Bengal being situated within its boundaries or within a few miles of them on the banks of the Hooghly. There are several flour and rice mills, a large number of oil mills, iron foundries, tanneries, etc., and the great Tata Iron and Steel Works at Jamshedpur are situated only about 150 miles away. Though an examination of the share register of the jute mills and other company-owned trading concerns in Calcutta would probably disclose a preponderance of Indian holders, control with but few exceptions is in the hands of British firms acting as managing agents. The outstanding industrial features of Bombay are its cotton spinning and weaving mills, over 80 in number, and it is at the same time the chief distributing centre in western India for very large imports of cotton manufactures. A preponderating share of the trade of Bombay is in Indian hands and the majority of the mills are under Indian management. Madras industrially is of no great importance, though it possesses the two most up-to-date cotton textile mills in India. It is not a terminal port and therefore, so long as tonnage is scarce, it is liable to suffer from infrequency of steamers calling. The chief industry of Rangoon is rice milling, but there is also a large export trade in timber and oil and the commercial importance of the city is developing rapidly. Though European capital and control predominate, there is a considerable Indian and Chinese element participating in the trade of Rangoon. In Karachi the wheat trade is largely financed by European firms, though Parsees, if to a much smaller extent than at Bombay, have important commercial interests.

Cawnpore.

Of the trade centres in the interior, undoubtedly that with the greatest potentialities is Cawnpore in the United Provinces with a population of nearly 200,000, which, industrially and commercially, is of great and growing importance. It is an important railway junction and its situation about 870 miles from Bombay and 630 from Calcutta has made it a convenient distributing centre for the imports of Manchester piecegoods, hardware and machinery from both these ports, while its factories produce very large quantities of leather goods, woollens, cotton textiles and tents. The city also boasts flour mills, iron foundries, bristle factories and chemical works and there are a number of flourishing minor industries.

Delhi.

Delhi, with a population of about a quarter of a million, is now the capital of the Indian Empire. It is the junction for nine railway lines and an important clearing house for the Punjab and the western districts of the United Provinces particularly in cotton, silk and woollen piecegoods. There are cotton spinning and weaving mills, a biscuit factory, and several flour mills.

It is noted also for its art industries, such has ivory carving, jewellery, lace work, silversmiths' work, pottery and gold and silver embroidery.

Ahmedabad.

Ahmedabad, with a population of 220,000, is next to Bombay the most important industrial centre in that Presidency. It contains 64 cotton mills.

Amritsar.

Amritsar, about 30 miles east of Lahore, with a population of 152,000, is also of considerable importance commercially. Apart from its entrepôt trade in piecegoods a large business in skins and hides is done here and its carpet industry is well known.

Agra.

Agra, with a population of 185,000, is, of course, chiefly famous for the architectural monuments of the Moghuls though its manufactures of carpets and *daris*, embroideries and stone work are considerable. It is also a collecting centre for better qualities of hides.

Bangalore.

Bangalore in the Mysore State has a population of 290,000. It is 219 miles by rail from Madras. Its chief manufactures are carpets, cotton textiles and woollen goods and leather. The Civil and Military Station which adjoins the city is an assigned tract under the administration of the British Resident.

Lahore.

Lahore, with a population of 228,000, is the capital of the Punjab and though of small importance industrially apart from the large workshops of the North Western Railway, it is the chief trading centre for the agricultural produce of the province.

Benares.

Benares, situated on the Ganges about 400 miles north-west of Calcutta, is the holy city of the Hindus. Commercially it is chiefly of interest on account of the very considerable silk weaving industry established there.

Lucknow.

Lucknow, with a population of 260,000, shares with Allahabad the claim to be the cold weather capital of the United Provinces. Its industries are of small moment but commercially it is of interest as a distributing and collecting centre for the rich agricultural produce of Oudh.

Nagpur.

Nagpur, on the line between Calcutta and Bombay, at the junction of the Great Indian Peninsula and Bengal Nagpur Railways is the capital of the Central Provinces. Its commercial importance is due to its prosperous weaving mills, cotton ginning and pressing factories, and the extensive manganese deposits in the neighbourhood.

Jubbulpore.

Jubbulpore, an important railway junction connecting the East Indian with the Great Indian Peninsula Railway, contains a central gun carriage factory, a number of spinning and weaving mills, pottery works, oil and flour mills and a large railway workshop.

Mirzapur, in the United Provinces (population 32,000), boasts a considerable brass industry for the manufacture of domestic utensils, but it is mainly important commercially on account of its shellac and carpet factories.

Mirzapur.

Madura, with a population of 135,000, is the centre of considerable silk and cotton weaving and dyeing industry and is the second town of importance in the Madras Presidency.

Madura.

Gwalior, the capital of the Gwalior State, contains a number of State owned factories and is the centre of an important stone quarrying and carving industry.

Gwalior.

Dacca, with a population of 108,000, is the most important city in Eastern Bengal, in the heart of the jute growing districts. Its muslins were formerly famous in Europe and there are still a number of handlooms working in the district.

Dacca.

Mandalay, the chief city of Upper Burma, with a population of 138,000 is located about 400 miles north of Rangoon on the Irrawaddy river. In the days of the Burma kings it thrived, but now its trade is declining, though the silk manufacturing industry is still of some importance.

Mandalay.

Srinagar, the capital of Kashmir, with a population of over 100,000, is situated on the Jhelum River. It is famous for its embroideries and carved wood work, and the largest silk filature in India.

Srinagar.

Sholapur and Amraoti are the centres respectively of the cotton industries of the Bombay Deccan and Berar, and other large cities not separately noted are: Hyderabad, the capital of the Nizam's Dominions with a population of over half a million, the centre of a considerable cotton trade, Allahabad (population, 171,000), Jaipur (population 137,000) in the Native State of the same name, the chief commercial city in Rajputana and famous for its artistic pottery and brassware, Baroda, the capital of the Gaekwar's territory about 245 miles north-east of Bombay, and Mysore with a population of 71,000.

Other cities.

PART VI

THE FINANCING OF TRADE

The bulk of India's external trade is financed by branches of the large British, Colonial and foreign exchange banks. The principal Exchange Banks transacting business in India are (1) *The Chartered Bank of India, Australia and China,* with Indian branches in Calcutta, Bombay, Madras, Rangoon, Delhi, Amritsar, Karachi and Tavoy ; (2) *the National Bank of India* with Indian branches in Calcutta, Bombay, Madras, Rangoon, Karachi, Lahore, Amritsar, Delhi, Cawnpore, Chittagong, Mandalay, Tuticorin and Aden ; (3) *the Mercantile Bank of India* with branches in Calcutta, Howrah, Bombay, Madras, Rangoon, Karachi and Delhi ; (4) *the Eastern Bank* with branches in Calcutta and Bombay and also in Baghdad, the head offices of these four banks being in London ; (5) *the HongKong and Shanghai Banking Corporation* with its head office at HongKong, and branches in Bombay and Calcutta ; (6) *the Yokohama Specie Bank,* with its head office at Yokohama, and branches in Calcutta, Bombay and Rangoon and (7) *the International Banking Corporation* of New York with branches in Calcutta and Bombay.

Exchange Banks.

It is to the Indian branches of these and other similar banking institutions that bills drawn on Indian importers of foreign merchandise will ordinarily come for collection on maturity, being sent to them either direct by the foreign drawer, or by the head office or other branch of the bank which has purchased the bills from him or with which he has arranged a credit ; and both in this way and in supplying local knowledge of the reliability and standing of purchasing firms, the Indian branches play a part of considerable importance in the import trade of the country. But it is with the export trade that their operations are chiefly concerned, and the methods which they adopt for financing it deserve explanation in rather more detail.

Except in the occasional years of famine or severe scarcity the balance of trade is ordinarily, and often very largely, in favour of India ; that is to say, the value of exported produce and merchandise appreciably exceeds the value of imported goods, and consequently the proceeds of import bills received by the Indian branches of the Exchange Banks for collection are in most years, even when supplemented by the considerable deposits that they obtain, insufficient to provide funds for the purchase of all the exporters' bills offered to them. Normally the gap is filled by the banks in one of three ways. They can place themselves in funds by purchasing the Secretary of State's council bills and telegraphic transfers ; by importing sovereigns ; or by importing gold and silver bullion.

Balance of trade.

In order to meet the heavy obligations of the Government of India in England (amounting to about £22 millions annually before the war), the Secretary of State for India sells for sterling rupee bills of exchange (usually called council bills) and telegraphic transfers payable by the treasuries in India. Tenders for a stated amount of these bills are invited weekly, and are received each Wednesday at the Bank of England. Allotments are made, up to the amount put up to tender but subject generally to a minimum price, to the highest bidders, and in normal times, and at present, tenders may be submitted by any person. But during the war council bills and telegraphic transfers were only sold to the British Exchange Banks, and to a few other recognised banks and firms; and even in normal times the greater part of the weekly amounts offered is generally taken by them.

Council bills.

Occasionally council bills and transfers are procurable on other days than Wednesday, being then termed intermediate bills and transfers, or 'Specials;' and during the war deferred telegraphic transfers, payable in India sixteen days after purchase in London, were issued to counteract the uncertainty of the mails. These 'Deferreds' are still obtainable.

Since sovereigns are at present legal tender in India at the rate of one pound equivalent to Rs. 15, and since the Government of India have also engaged to give rupees at their treasuries in exchange for sovereigns at this rate, it is clear that the import of sovereigns affords Exchange Banks an alternative method to the purchase of council bills, whereby to transfer to India the proceeds on maturity of the exporters' bills which they have purchased. It will also be observed that the existence in normal times of this alternative method of remittance limits the price which will be offered for the Secretary of State's council bills and transfers, since obviously no remitter will offer a higher price for councils than the cost of laying down sovereigns in India. During the war, however, the import of gold coin into India except on Government account was prohibited, and the practical difficulty of obtaining sovereigns still operates as a check on this method of remittance.

Import of sovereigns.

The third plan open to the Exchange Banks, the import of gold and silver bullion, is in reality more an ordinary commercial, than an exchange, transaction. From time immemorial there has been in India a keen demand for the precious metals for domestic purposes, jewellery and the like, and the import of bullion to meet this demand normally operates in exactly the same way as the import of other merchandise to reduce a favourable trade balance; only, when the exchange banks are the importers, the proceeds of the sale of the bullion in the bazaars become immediately available to finance exporters' purchases of produce. During the war the import of both gold and silver except on Government account was prohibited, so that this method of settling the trade balance ceased to be available, and both gold and silver have still, at the time of publication, to be sold on import to Government at prices notified from time to

Import of bullion.

time. It seems unlikely however, that it will be possible to deprive India for any prolonged period of a free market in the precious metals, and with the gradual removal of the war-time restrictions, import of, at any rate, gold bullion may be expected to take a prominent place among the methods of settling the trade indebtedness of other countries to India.

Exporters' bills purchased by the Exchange Banks instead of being held till maturity are frequently rediscounted on arrival in London, and the banks are thus able to secure a quick turnover of their resources. Indian bills, both import and export, are usually drawn at three months' sight, but bills of four months' usance are not uncommon, and occasionally six months' bills are taken.

Presidency Banks.

The upcountry branches of the Exchange Banks also engage in the local trade of the places in which they are situate; but their number is not large, and for the most part the finance of the internal trade of the country is in the hands of the Presidency Banks of Bengal, Bombay and Madras, of a certain number of joint stock banks, and of the large class of indigenous bankers variously known in different parts of the country as *shroffs*, *mahajans*, *chetties*, etc. At the head of this system stand the Presidency Banks.

By the Act regulating their working the Presidency Banks are prohibited from engaging in external exchange operations; but the balances of Government in the presidency towns are deposited with them; they frequently hold the unemployed cash of the local banks, including the Exchange Banks; they make advances to them, when necessary, on Government or other securities; and in times of stress they come to their relief if they are in difficulties. There is thus a tendency for the Presidency Banks to occupy the role of the 'Bankers Bank,' a tendency which will perhaps be accelerated if, as is expected, the three banks shortly amalgamate.

The amalgamation, if it eventuates, is expected to lead to the opening by the Presidency Banks of a large number of new branches, which will share with the existing branches of these Banks and with a certain number of old established joint stock banks, such as the Alliance Bank of Simla or the Allahabad Bank in the development of internal trade. But the banking facilities of the country at large are at present so inadequate that there is room for a large growth in the operations of joint stock banks without any undue curtailment of the sphere of the indigenous banker; and it is the latter who, with the assistance of the Presidency Banks, is, and will probably continue to be, responsible for a great portion of the internal trade of India.

Hundis.

This trade is financed by the Presidency Banks in two ways, either directly by advances against merchandise hypothecated to them, or indirectly through *shroffs* whose *hundis* or internal bills of exchange they purchase. In the latter operation the Presidency Bank is at the centre of a web at whose extreme circumference may be found the local dealer in grain. Probably the actual *shroff* from whom a bill is bought will be a man

well known to the Bank in a presidency town or one of the larger cities; but he will only have come to the bank for accommodation when he has exhausted his available funds in purchasing or discounting the bills of smaller *shroffs* upcountry, and this process will be repeated possibly more than once, until the village purchaser of grain from a cultivator, the original drawer of the bill, is reached. In the instance taken the bill would be a produce bill, but for approved customers the Presidency Banks often discount pure finance bills, known as 'hand' bills.

The discount or *hundi* rate charged by the Presidency Banks generally rises and falls approximately to the same extent and at the same time as the bank rate.

Clearing houses.

The principal clearing houses in India are those situated at the presidency towns of Calcutta, Bombay, and Madras and at Karachi. The Presidency Banks, the Exchange Banks and most of the English banking agency firms and the better known local joint stock banks at these places constitute the membership of these clearing houses, but no bank as of right is entitled to be a member unless approved by the rest. The Bank of Bengal at Calcutta, the Bank of Madras at Madras and the Bank of Bombay at Bombay and Karachi performs in each case the functions of settling bank at the centres named.

The following table shows the total amount of cheques cleared annually at the four clearing houses.

TABLE No. 24.—*Total amount of cheques cleared annually at clearing houses from* 1907 *onwards, in thousands of pounds.*

Year.	Calcutta.	Bombay.	Madras.	Karachi.	TOTAL.
	£	£	£	£	£
1907	149,633	84,300	10,320	3,533	247,786
1908	141,873	83,900	11,693	4,287	241,753
1909	131,840	95,833	12,986	4,680	245,339
1910	148,253	111,013	14,113	5,033	278,412
1911	171,753	117,366	13,886	5,080	308,085
1912	192,207	138,873	7,680	7,727	346,487
1913	220,887	145,933	15,600	8,126	390,546
1914	186,873	117,973	14,180	8,767	327,793
1915	215,106	109,746	12,580	9,013	346,445
1916	320,113	160,340	16,633	10,020	507,106
1917	314,620	224,366	15,593	13,520	568,099

PART VII

IMPORT TRADE

Features of foreign trade.

The outstanding feature of India's foreign trade from the earliest times has been her absorption of the precious metals. The commercial trend has always been towards the West but from the days of the Roman Empire until the enterprise of the East India Company more or less stabilised the sea route round the Cape exchanges were mainly confined, owing to the difficulties of land transport, to articles of high value and comparatively small bulk, such as costly muslins, silks, ivory and precious stones. With the application of steam to sea traffic and the opening of the Suez Canal the character of the trade was permanently changed and the greater part of India's international exchanges are now concerned with raw materials of considerable bulk and comparatively low value. During the last sixty years the excess of exports over imports has been persistent and increasing. During the first four periods for which figures are given in the table below, the excess was equivalent to 16 per cent and in the twenty years ending 1913-14 this excess had risen to 27 per cent. It is possible, however, that the statistics somewhat exaggerate the difference, as the export figures are based on the declarations of merchants at the different Custom Houses and there is no such automatic check on overvaluations as the ordinary tariff provides in the case of imports where returns of quantities and values are based on bills of entry, the value being the wholesale value at the place of import less trade discount, and Customs duty, if any, leviable.

TABLE No. 25.—*Average trade of India in quinquennial periods from 1854-55.*

Year.	Imports. Value in £	Exports. Value in £
1854-55 to 1858-59	17,900,000	17,233,333
1859-60 to 1863-64	27,373,333	28,780,000
1864-65 to 1868-69	32,880,000	38,440,000
1869-70 to 1873-74	27,566,666	38,560,000
1874-75 to 1878-79	32,146,666	42,086,666
1879-80 to 1883-84	41,213,333	53,606,666
1884-85 to 1888-89	50,086,666	60,186,666
1889-90 to 1893-94	59,133,333	72,446,666
1894-95 to 1898-99	59,040,000	75,953,333
1899-1900 to 1903-04	73,793,333	91,046,666
1904-05 to 1908-09	104,000,000	146,893,333
1909-10 to 1913-14	132,580,000	155,033,333
1914-15 to 1918-19 *	122,086,000	154,360,000

* Exclusive of statistics of Treasure for 1917-18 and 1918-19.

History of import trade.

In the first century A.D. in return for her exports of spices, precious stones and cotton fabrics of the finest texture, India received corals, copper, tin and lead as well as the precious metals and until the seventeenth century these items predominated in the import list. The early history of the East India Company is a struggle against bitter opposition, based on the fact that the trade with the East Indies involved the export of bullion from England and did not sufficiently enlarge the market for the latter's woollen manufactures, and to silence this opposition as far as possible the Company had to export woollen goods in excess of the Indian demand and to sell them at a loss. Until the spinning jenny was invented no European looms could compete with those of Dacca and Surat, but the import of cotton goods from India was banned by one Act as inimical to the English wool trade and later by another as threatening the infant Manchester weaving industry. The Home Government looked to the East India Company to supply saltpetre for its gunpowder and hemp for its shipping, but the Indian silk industry had considerable ups and downs. In the first half of the eighteenth century exports of bullion from England to India aggregated 27 millions, while the value of goods exported to India was only 9 millions. A great change was effected by the battle of Plassey when the Company acquired control of the revenues of Bengal. Between 1760 and 1809 the total exports of bullion amounted to £14½ million only while the value of merchandise shipped to India increased to £48½ million. The first half of the nineteenth century witnessed a remarkable change in the character of the trade between India and England. Henceforward India began to receive those very commodities as imports which had hitherto bulked so largely in her export trade, *viz.*, cotton manufactures and sugar. The Lancashire cotton industry had so developed that by the middle of the century imports of cotton piecegoods represented about half the total imports of foreign merchandise into India. In 1869-70 of a total of £21,946,660 cotton manufactures accounted for £10,846,660, almost all from the United Kingdom. The next most important single item was the head which includes wines, beer and spirits which amounted to more than £1,000,000, followed by copper for domestic utensils £906,660, iron and steel £873,330 and salt £500,000. Sugar had then scarcely begun to take its curiously prominent place among the imports into the greatest sugar producing country in the world but in the next half century, the value of arrivals of sugar increased from £476,660 to £5,000,000 annually. Other classes of imports which have increased in volume and importance in recent years have been mineral oil (kerosene) which has superseded to a great extent vegetable illuminants even in remote bazaars upcountry, matches, and provisions and oilmanstores, while the arrivals of spices have almost reached double the level of India's exports of the same commodities. Until progress was suspended temporarily by the war, the most satisfactory features of recent years have been the increasing volume of imports of iron and steel and machinery and railway material, while aluminium and enamelled ware have reduced the prominent position which copper formerly held.

TABLE No. 26.—*The principal articles of importation into India from 1913-14 to 1918-19 and their values.*

Name of the article.	1913-14.	1914-15.	1915-16.	1916-17.	1917-18.	1918-19.
	£	£	£	£	£	£
Cotton manufactures—	*44,199,510*	*32,665,935*	*28,850,363*	*35,376,407*	*37,801,744*	*40,369,871*
Grey piecegoods .	16,966,515	14,192,302	12,057,408	11,246,501	12,288,207	15,729,434
Coloured piecegoods.	11,907,683	6,975,603	5,704,497	10,058,921	10,763.835	7,879,640
White piecegoods.	9,523,204	7,239,125	7,122,499	8,529,012	9.469,884	8.753,647
Twist and yarn .	2,776.163	2,567,861	2,451,366	2,699,303	2,863,451	5,910,899
Other sorts .	3,025,945	1,691,044	1,514,593	2.842.670	2,416,367	2,096,251
Iron and Steel .	10,671,928	6,512,649	6,128,280	5,920,409	5,171,997	8,299,919
Sugar . . .	9,971,251	7,014.990	11,078.531	10,300,210	10,213,173	10,409,094
Railway material .	6,689,794	6,721,719	2,812,348	1,045,718	330,890	695,659
Machinery and Mill work.	5,172,206	4,026,996	3,184,935	3,632,272	2,948,842	3,335,597
Mineral oil . .	2,743.764	2,938,027	2,676.490	2,959,541	2,427,128	2,408.790
Hardware . .	2,632,089	1,706,667	1.587,402	2,072,479	1,810,314	2,138,897
Woollen manufactures.	2,568,168	1,256,491	639,078	1,313.573	1,398,130	1,449,492
Silk manufactures.	2,067,553	1,292,591	1,839,462	1.894,030	1,902,139	2,472,674
Provisions and Oilmanstores.	1,649,087	1,404.807	1,408,482	1,872,751	1,182,477	1,292,074
Copper (excluding ore).	1,373,852	941,315	358,826	169,448	429,504	457,538
Glass and Glassware.	1,296,853	643.449	709.633	1,000,631	1,083,059	830,711
Instruments and Apparatus.	1,214.014	890,718	868,762	1,167,589	1,149,657	1,445,331
Spices . .	1,154,875	1,145,769	1,248,055	1,296,937	1,267,578	1,606,132
Apparel . .	1,140,992	715,752	925,901	1,052,781	864,098	1,223,173
Haberdashery and Millinery.	1,066,551	578,193	648,950	889,877	582.576	710,577
Paper and Pasteboard.	1,058.454	879,298	961,602	1,553,991	1,540.813	1,813,779
Motor cars and cycles.	1,022,042	682,869	862,277	1,429,384	481.094	259,261
Dyeing and Tanning substances.	942,633	477,745	304,199	764,837	940,663	1,059,951
Spirits . .	852,670	757.422	794,858	1,024,286	1,154,027	1.495,902
Silk (raw) . .	839,309	755,697	719,532	732,694	774,327	693,575
Drugs and Medicines.	780,490	684,710	819,635	929,355	889,210	977,962
Fruits and Vegetables.	753,583	761,492	826,949	779.434	687,849	641,304
Precious stones and Pearls, unset.	714,693	136.056	317,031	411,719	444,018	252,345
Carried over .	102,576,361	75,591,357	70,571,581	79,590,353	77,515,307	86,339,608

TABLE NO. 26.—*The principal articles of importation into India from 1913-14 to 1918-19 and their values*—concld.

Name of the Article.	1913-14.	1914-15.	1915-16.	1916-17.	1917-18.	1918-19.
	£	£	£	£	£	£
Brought forward	102,576,361	75,591,357	70,571,581	79,590,353	77,515,307	86,339,608
Coal, Coke and Fuel	710,920	523,223	181,086	102,965	49,548	156,933
Building and Engineering materials.	707,139	647,850	710,609	636,759	754.677	543,583
Aniline and Alizarine dyes.	699,915	313,237	113,808	435,855	652.050	142,506
Chemicals	676,506	683,361	972,426	1,251,322	1,815,004	1,661,710
Matches	597,651	753,245	922,040	771,318	1,565,585	1,098,353
Salt	584,432	493,569	1,264,054	1,276,375	1,467,193	1,554,018
Paints and Painter's material.	548,869	503,051	541,116	765,346	644,854	845,429
Tobacco	501,923	481,757	534,343	834,215	1,133,123	1,430,736
Soap	500,400	555,492	563,505	673,112	755,594	667,424
Timber	497,553	474,347	434,438	661,840	753,354	431,818
Stationery (excluding paper, etc.)	466,528	346,596	378,665	516,061	429,760	466,447
Beer, Ale and Porter.	439,385	316,998	302,618	338,806	349,151	461,137
Rubber	352,661	381,978	609,410	650,383	771.906	828,174
Tea chests	349,435	297,302	548,648	580,887	629,569	606,736
Belting	281,937	239,791	309,056	369,099	536,981	557,548
Horses	237,934	298,273	306,192	486,929	357,482	232,277
Cutlery	188,882	98,678	72,591	101,279	107.110	127,980
Grain, Pulse, etc.	186,560	311,450	542,654	121,586	51.538	749,030
Cotton, raw	181,819	194,440	64,535	145,710	274,187	802,563
Carriages and Carts	169,169	89,872	54,268	64,097	46.900	71,997
Grand Total	122,165,288	91,952,644	87,990,829	99,756.843	100,283.407	112,689,428

Cotton manufactures. Though the innate conservatism of the bazaar tends to maintain the markets of particular classes of brands and goods there is little evidence in the records of trade of preference for and against the goods of any particular country. The traditional customs of the greater portion of the Indian population contend to stereotype the demand for particular classes of cotton manufactures which admit of little variation. The unbleached *dhooti* and *sari* which are worn by so many millions are the staple articles of import from Manchester. An improvement has been recorded in recent years in the imports of white and coloured goods. This improvement which persisted until the closing months of the war seemed to point to a slow but definite change in the public taste, but was probably more correctly ascribable to the more effective competition in Bombay mills in the production of grey goods of qualities superior to the *T*

cloths and *domestics* in which they formerly specialised. The local character of the factors affecting the situation is emphasized by the fact that Calcutta, the port which serves Bengal, Bihar and the eastern half of the United Provinces and Central Provinces, as well as participating in the rationing of the big upcountry entrepôts of Delhi and Cawnpore continued to import a preponderating quantity of unbleached goods throughout, and in 1918-19 the general decline registered in the total volume of imports of cotton manufactures into India was less marked in the case of grey than of white and coloured goods owing to the large arrivals of unbleached longcloth and shirtings from Japan. In this connection it is significant that the share of the United Kingdom in the import of grey goods fell from 98·8 per cent in 1913-14 to 64 per cent in 1918-19 while that of Japan rose from ·2 per cent to over 35 per cent. No less than 66 per cent of the total imports of cotton manufactures into Calcutta in 1913-14 were unbleached goods in a year when her total imports of cotton manufactures represented one half of the imports for all India and in 1918-19 the percentage was 69, while Bombay's share of total imports in the latter year was about 38 per cent including twist and yarn. Madras, like Bengal, continues to exhibit a marked preference for the unbleached article but the figures for Karachi in 1918-19 are 58 per cent for white, 29 per cent for coloured and 10 per cent only for grey. The Rangoon market is *sui generis*. The Burman prefers to wear a lower garment of coloured silk but for work-a-day use he is content with a cotton substitute which custom demands should be coloured and the proportion of coloured piecegoods in the total volume of imports was 50 per cent in 1913-14, of white which is required by the emigrant Indian population, 25 per cent and of grey 10 per cent. The corresponding percentages for 1918-19 were 50 per cent, 30 per cent and 8 per cent respectively. The marked decline particularly during the last three years of the war in the volume of piecegoods imported is ascribed to industrial conditions in the United Kingdom, shipping difficulties and high freights which enabled Indian manufacturers to undersell Lancashire in many lines where importers had hitherto been unchallenged.

Sugar.

In 1897-98 the total imports of sugar were 212,000 tons of which just over half was shewn as beet sugar. The countervailing duties imposed in 1899 and enhanced in 1902, to prevent the ruin of the cane sugar industry by the bounty-fed beet sugar, did not restrict the volume of imports, for as the supply of beet sugar declined its place was taken by cane. Mauritius, which already supplied more than any other individual country, nearly doubled its shipments by 1903-04, while in the same period Java made a very remarkable advance, increasing its supplies from 7,000 tons to 56,000 tons. Java continued its progress during the next ten years, and in 1913-14 sent 583,000 tons out of total imports of 803,000 tons; Mauritius contributing 138,000 tons only and, although the countervailing duties had meanwhile practically become a dead letter owing to the adherence of most countries to the Brussels Convention, the imports of beet sugar from all sources only amounted

to 75,000 tons. In Sind, sugar was by far the most important item after cotton manufactures while in Bombay and Bengal it contended with iron and steel for second place; in Madras and Burma on the other hand, sugar imports were not so prominent.

Iron, steel and machinery.

Bengal with its jute mills and its collieries and Bombay with its cotton mills divide between them the bulk of the imports of iron and steel and machinery and millwork which when war broke out had assumed a position only second to that held by cotton manufactures in India's import trade, and when its effects are no longer felt, these imports may be expected to bulk even more largely in the table. The author of the 'Review of the Trade of India for 1903-04' in mentioning that the importations of iron and steel in that year totalled 459,155 tons remarked that this was an advance of nearly 85 per cent on the figures for 1898-99, which he described as a 'year of normal trade.' In the face of this remark, it is interesting to note that ten years later in 1913-14 the total had risen to 1,015,512 tons. More than a quarter of this consisted of galvanized sheets, the popularity of which in building, especially for roofing sheds and warehouses is visible to anyone who travels in India. It may reasonably be supposed that the iron and steel trade will soon return to the pre-war level, the heavy decline during the war being due to the partial cessation of supplies from the United Kingdom and the total disappearance of those from Germany. Similar causes led to a great reduction in imports of machinery and mill-work, which in 1913-14 had a value twice as high as that recorded in 1903-04, itself, judged, by previous standards, a very good year. In the same way imports of railway materials advanced from £3¾ millions sterling in 1903-04, which year eclipsed all previous records, to more than £6 millions in 1913-14 exclusive of imports on State Railway account which accounted for another 2½ millions.

Silk and spices.

Silk goods are so generally used by the Burmese of both sexes for personal adornment that the imports of that commodity are to some extent an index of the material prosperity of that province. Bombay is, however, by far the most important Indian market for imported silk manufactures, of which Bengal, Sind and Madras take little. The chief item which shews Madras in a place much higher than its general position is that of spices, principally betel-nuts.

Provincial distribution.

Regarding private trade as a whole, its division between provinces (including treasure with merchandise) in 1913-14 was as follows:—Bombay 43 per cent, Bengal 35 per cent, the balance falling in nearly equal shares to the other three maritime provinces. But Bombay's figures include practically the whole of the imports of treasure, and if the figures of private merchandise alone are taken, the apportionment should be as follows:—Bengal 39 per cent, Bombay 34 per cent, Madras, Sind and Burma 9 per cent each. Bengal was the chief importer of salt, and Burma next, the other maritime provinces relying practically entirely on indigenous supplies. A striking feature of the trade of Burma is the relatively large quantity of provisions and silk manufactures which it imports. The fact that that province

took more than *half the total Indian imports* of milk and butter may be attributable to the national aversion from keeping milch cows, but as an importer of biscuits and canned and bottled provisions, as well as of other luxuries such as domestic hardware, Burma takes a position quite out of proportion to its population, which can only be ascribed to a higher standard of living and to a greater freedom from oriental conservatism.

Effects of the war.

It is difficult to draw conclusions of any permanent value from the changes which have occurred since the outbreak of war, the comparisons being vitiated to a great extent by the unparalleled rise in prices. The general decline in the volume of imports of cotton piecegoods has already been commented on, as has the falling off in supplies of iron and steel. A considerable advance in imports of chemicals may be explained as due to the development of internal industries which require these articles for their processes; matches registered an advance in quantity and value but not in quality; while the improvement in tobacco figures is largely due to the increasing consumption of cigarettes by the civil population, as well as to larger demands for the troops in India and the adjoining theatres of war.

Origin of imports.

Perhaps the most interesting effect of the war on India's import trade is the redistribution of the business between various countries participating in it. This is illustrated progressively in the following table.

TABLE No. 27.—*General distribution of import trade showing the percentages borne by the principal countries in the imports of merchandise into India in the six years ending 1918-19.*

Name of country.	1913-14.	1914-15.	1915-16.	1916-17.	1917-18.	1918-19.
United Kingdom	64·1	67·4	59·4	58·7	54·3	45·5
Germany	6·9	3·4	·3*	·05*	·007*	..
Java	5·8	5·9	10·2	8·9	7·7	6·6
Japan	2·6	3·3	5·7	8·9	12·1	19·8
United States of America	2·6	3·5	6·0	7·3	7·8	9·5
Belgium	2·3	1·2	·2	·02	·004	·003
Austria-Hungary	2·3	·9	·004*	·01*	·04*	..
Straits Settlements	1·9	2·4	2·9	2·6	3·4	3·3
France	1·5	1·3	1·5	1·4	1·0	1·1
Mauritius	1·4	1·2	1·6	·6	·7	1·5
Italy	1·2	1·1	1·5	1·7	1·1	·5
China	·9	1·1	1·5	1·1	1·3	1·4
Holland	·8	·9	·9	·7	·4	·1
Australia	·5	·6	·5	·7	·5	1·3
Hongkong	·5	·7	1·0	·7	·9	1·0
Persia	·4	·5	·5	·5	·7	·6
Ceylon	·4	·6	·7	·8	1·6	1·7
Russia	·03	·03	·06	·2	·08	·003

* Prize vessels condemned.

The country of import for the purpose of the above table is the country from which the goods have come whether by land and sea or sea only, without interruption of transit save in the course of transhipment or transfer from one means of conveyance to another.

Even before the war, the margin by which the United Kingdom had dominated all other competitors had been subject to gradual reduction. In 1853-54 the United Kingdom sent nearly 76 per cent of the whole imports, foreign as well as coasting, into Bengal, China coming next with 5 per cent and 'New Holland' (Australia) with 4 per cent, while France with 3½ per cent was practically the only European competitor, shipments from Antwerp and Cadiz being very small, from Hamburg negligible, and from Rotterdam non-existent. Coming to more recent times, the United Kingdom in 1903-04 supplied 64·9 per cent of the foreign imports, Belgium coming next with 3·9 per cent, and Germany with 3·4 per cent; while Russia's percentage was 2·9, that of Austria-Hungary 2·6, of France 1·9, and of the United States and Japan 1·5 each. Ten years later in 1913-14, as the above table shews, the United Kingdom still retained its position almost unchanged, Belgium's share had fallen to 2·3 per cent and Russia's became negligible, while Germany's percentage had grown to 6·9 and the United States and Japan had progressed *pari passu* to 2·6 per cent each. The increase in the trade with Germany was attributed partly to the special technical skill which that country developed in certain lines and partly to the displacement of expensive British goods by cheaper substitutes more readily absorbed in the bazaar. The latter advantage passed after the outbreak of war to Japan and the great benefit which that country was able to secure from war conditions is amply illustrated in the above table. As for the United Kingdom the steady decline in its superiority arose directly or indirectly from war conditions, the diminution in the volume of some exports from that country being due to the Home Government's control and of ~~others to~~ the restrictive effect of high prices. Japan and the United States of America owe their advances principally to the fact that Indian importers of iron and steel and other hardware were perforce compelled to turn to one or other of these countries to replace the supplies which they could no longer obtain from England. Other heads under which imports from Japan shew a great advance on pre-war figures are glass and glassware, cotton piecegoods with paper and paste-board, while large quantities of dyestuffs came in from the United States. It will be interesting to see how far the favourable position in which these two countries now find themselves will be maintained after the ratification of peace.

PART VIII

EXPORT TRADE

Nature of export trade.

A brief survey of the early history of Indian trade having been made elsewhere, and detailed references to the case of particular exports being subjoined, (*vide* p. 103 *et seq*) it is only necessary to say in general terms that with the growth of mechanical aids to manufacture in Europe, India has since the beginning of the nineteenth century come to be regarded like Argentina chiefly as a producer of primaries. In a year of seasonal prosperity India is able to grow wheat and rice in excess of the needs even of her vast population, and her shipments of food grains with those of raw cotton, raw jute, raw hides and skins and oil seeds constitute one-half of her total exports. The principal exceptions to this classification are jute manufactures which during the war have taken an increasingly prominent place in the table and East India ' kips ' (partially tanned hides). Generally speaking the tendency of the last five years has been in the direction of larger exports of manufactured or partially manufactured goods, though it is not yet sufficiently strong to make any great impression upon the general statistics, and it remains to be seen how far, as trade returns gradually to its normal channels, this encouraging feature will persist. In the following table the values of the principal articles of Indian merchandise exported from India are shewn in order of relative importance in 1913-14 and for subsequent years.

TABLE No. 28.—*Exports of principal articles of Indian merchandise and their values from 1913-14 to 1918-19.*

Articles.	1913-14.	1914-15.	1915-16.	1916-17.	1917-18.	1918-19.
	£	£	£	£	£	£
Jute—						
Raw jute	20,550,929	8,606,802	10,428,024	10,858,736	4,302,559	8,480,052
Jute manufactures (including twist and yarn).	18,848,759	17,213,440	25,318,934	27,781,156	28,562,050	35,101,436
Cotton—						
Raw cotton	27,361,655	22,325,631	16,619,247	24,067,506	28,438,272	20,655,709
Cotton manufactures (including twist and yarn).	8,079,972	5,340,352	6,403,973	9,095,084	8,889,636	9,360,216
Carried over	74,841,315	53,486,225	58,770,178	71,802,482	70,192,517	73,597,443

Table No. 28.—*Exports of principal articles of Indian merchandise and their values from 1913-14 to 1918-19*—contd.

Articles.	1913-14.	1914-15.	1915-16.	1916-17.	1917-18.	1918-19.
	£	£	£	£	£	£
Brought forward .	74,841,315	53,486,225	58,770,178	71,802,482	70,192,517	73,597,443
Grain, Pulse and Flour .	*30,094,279*	*19,366,046*	*19,380,794*	*23,492,136*	*35,773,481*	*26,710,384*
Rice not in the husk .	17,599,582	11,339,322	10,192,587	12,326,084	13,773,789	15,310,023
Wheat and wheat flour.	9,589,639	6,158,866	6,373,918*	6,967,608*	13,674,760*	5,045,083*
Barley . . .	1,043,799	174,548	1,168,003	1,509,615	2,693,512	1,845,110
Pulse . . .	711,009	676,143	972,159	1,736,969	2,438,579	446,745
Millets (*jawar* and *bajra*).	576,164	743,441	288,102	261,217	120,300	56,182
Gram . . .	415,104	156,195	224,590	275,465	2,328,532	2,233,414
Maize . . .	*13,969*	*8,191*	*14,332*	*163,083*	*631,489*	*104,832*
Oats	3,391	5,580	24,548	8,240	6,575	5,409
Seeds	*17,116,959*	*9,769,271*	*6,748,401*	*11,102,763*	*5,481,763*	*7,478,903*
Linseed . . .	4,457,998	3,502,411	1,982,782	4,836,051	1,785,307	4,391,402
Groundnut . .	3,254,246	1,515,608	1,668,957	1,699,701	1,238,247	249,891
Rape . . .	2,851,711	1,083,719	938,576	1,187,448	588,378	968,811
Sesamum . . .	1,796,841	711,885	164,170	1,091,659	230,064	47,076
Cotton . . .	1,416,743	1,004,524	445,077	203,940	9,587	11,810
Castor . . .	1,336,649	773,289	802,185	964,369	1,177,435	1,534,228
Copra . . .	1,039,826	821,923	381,859	666,399	140,216	13,990
Mowra . . .	363,634	50,674	24,327	26,480	2	15
Poppy . . .	310,589	95,610	82,012	63,140	28,194	50,336
Mustard . . .	70,724	40,400	55,778	119,174	41,135	48,817
†Tea	55,002	36,442	28,660	28,377	76,444	14,509
Niger . . .	42,926	22,154	4,823	15,743	50	492
Coriander . . .	39,099	46,327	70,953	68,541	80,011	65,347
Cummin . . .	30,495	26,683	69,746	90,464	67,625	50,499
Ajwan . . .	2,983	2,736	4,871	4,304	2,765	2,102
Tea	9,983,372	10,352,329	13,320,715	11,180,649	11,781,746	11,850,404
Hides and Skins and Leather.	*10,648,737*	*8,384,775*	*10,288,963*	*16,06,247*	*9,540,791*	*12,694,519*
Hides, raw . .	5,530,638	3,500,693	4,523,590	4,994,675	2,057,092	1,742,736
,, tanned . .	1,058,575	1,606,649	2,041,582	2,995,561*	3,269,595*	4,744,979*
Skins, raw . . .	2,260,244	1,695,583	1,995,184	4,610,898	3,295,321	4,481,107
,, tanned . .	1,758,591	1,552,269	1,699,177	3,309,337	904,390	1,701,428
Opium	2,280,031	1,175,639	980,123	1,397,680	1,605,156	2,086,049
Wool—						
Raw wool . . .	1,669,646	1,579,339	2,527,298	2,569,027	2,716,506	3,594,992
Wool manufactures .	167,349	113,164	160,447	209,068	107,050	117,032
Carried over .	146,701,688	94,225,788	112,176,919	137,760,052	137,199,010	138,131,972

* Including exports on Government account.
† For details see under article on Tea.

TABLE NO. 28.—*Export of principal articles of Indian merchandise and their values from 1913-14 to 1918-19*—contd.

Articles.	1913 14.	1914-15.	1915-16.	1916 17.	1917-18.	1918-19.
	£	£	£	£	£	£
Brought forward	146,701,688	94,226,788	112,176,919	137,760,052	137,199,010	138,131,072
Metals and Ores	*1,462,994*	*1,064,743*	*1,457,179*	*2,478,884*	*1,961,845*	*2,104,146*
Manganese ore	808,763	502,019	553,906	836,171	571,121	501,533
Tungsten ore	..	..	†357,439	700,314	724,409	751,349
Iron or Steel (including iron ore).	300,970	190,243	264,811	511,688	216,648	87,766
Lead	59,309	115,210	239,028	364,895	339,510	287,122
Zinc, all sorts	31,796	23,069	3,765	15,930	10	*Nil*
Chromite	9,205	12,404	4,922	10,473	32,717	82,046
Lac	1,310,535	1,070,496	1,145,054	1,868,779	2,518,535	1,965,640
Coffee	1,024,402	1,102,515	657,955	717,837	662,088	795,856
*Oilcakes	920,249	709,219	787,501	662,684	472,840	562,941
Wood and Timber	*714,092*	*628,719*	*532,394*	*471,501*	*274,885*	*473,617*
Timber	571,636	579,531	420,866	334,877	215,998	423,390
Sandalwood	128,626	35,918	103,796	130,351	52,347	10,529
Dying and Tanning substances.	*693,526*	*1,078,037*	*2,086,896*	*2,020,033*	*1,483,918*	*1,366,568*
Myrobalan	379,626	350,450	470,157	418,895	315,303	328,936
Indigo	141,938	599,691	1,385,795	1,408,373	1,018,766	832,340
Turmeric	87,450	43,594	53,220	106,979	94,351	111,804
Cutch and Gambier	62,162	69,844	161,333	70,904	44,751	77,189
Divi-divi (from Madras).	3,288	3,028	2,893	2,712	455	1,859
Hemp, raw	682,319	662,889	683,583	1,074,124	529,602	978,641
Oils—						
*Vegetable, non-essential.	*385,653*	*466,006*	*555,003*	*714,438*	*1,020,430*	*1,868,132*
Coconut	155,073	246,209	261,479	288,673	405,832	976,987
Castor	92,504	83,550	129,301	174,355	255,337	298,102
Rape and Mustard	48,624	49,594	51,017	66,030	59,415	51,532
Groundnut	30,013	22,967	38,943	108,022	127,195	84,740
Sesamum	28,699	25,462	17,490	28,065	33,046	19,557
Linseed	17,493	27,869	47,274	32,830	127,582	431,018
Mineral oil	142,732	170,117	182,863	167,923	126,556	230,692
Essential oil	*113,992*	*57,006*	*73,190*	*127,604*	*220,679*	*282,809*
Lemon grass oil	67,955	37,914	30,102	32,044	25,944	22,181
Animal oil	*14,708*	*8,188*	*1,512*	*479*	*5,564*	*15,761*
Fish oil (from west coast of Madras).	14,639	7,952	1,503	425	1,272	6,577
Carried over	153,895,458	101,009,412	120,082,484	147,768,332	146,123,153	148,246,613

* For details of this trade see articles under respective seeds.
† Not separately recorded previously.

TABLE No. 28.—*Exports of principal articles of Indian merchandise and their values from 1913-14 to 1918-19*—concld.

Articles.	1913-14.	1914-15.	1915-16.	1916-17.	1917-18.	1918-19.
	£	£	£	£	£	£
Brought forward	153,[illegible]95,458	101,009,412	120,082,484	147,768,332	146,123,153	148,246,613
Manures	629,570	377,785	295,777	374,984	315,884	410,216
Spices	*609,404*	*638,615*	*619,242*	*730,204*	*72[illegible],017*	*728,272*
Pepper	289,943	309,241	308,347	411,849	345,564	408,889
Chillies	134,220	173,516	180,549	159,,550	175,710	188,170
Ginger	122,661	87,321	71,351	84,337	111,632	65,707
Cardamom	49,994	54,369	49,597	32,400	80,221	51,605
Betelnut	8,224	10,111	6,826	8,413	11,771	8,119
Cinnamon	1,015	869	1,144	1,356	1,064	2,329
Cloves	231	358	552	239	887	1,883
Coir (excluding cordage and rope).	604,190	353,790	431,333	439,752	309,347	237,6[illegible]9
Rubber, raw	524,486	622,015	844,482	1,054,419	1,081,289	1,669,527
*Fodder, Bran and Pollards.	516,069	449,914	492,020	314,927	74,653	63,868
Coal, Coke and Patent fuel	461,424	351,992	491,667	508,129	159,363	104,208
Paraffin wax	448,736	548,135	542,477	677,957	739,901	745,652
Fruits and Vegetables	*412,762*	*342,622*	*400,333*	*411,507*	*350,869*	*398,279*
†Coconuts	1,517	948	1,000	835	1,657	3,358
Provisions and Oilman-stores.	*362,939*	*303,195*	*351,257*	*473,435*	*469,130*	*412,026*
Ghi	232,945	193,831	205,142	221,386	252,260	235,666
Butter	38,986	29,660	45,098	82,025	95,624	48,584
Tobacco	319,566	245,366	293,390	353,155	341,360	642,206
Mica	302,564	191,066	208,496	341,255	575,285	598,971
Fish	261,584	235,846	284,126	307,975	299,935	293,979
Chemicals and Preparations.	*219,049*	*300,327*	*492,149*	*748,714*	*708,017*	*753,915*
Saltpetre	205,598	285,575	459,124	703,697	591,572	621,660
Borax	5,131	6,191	10,010	14,102	5,875	10,634
Silk—						
Raw silk	164,943	79,387	160,803	328,796	320,291	433,393
Silk manufactures	37,873	23,018	22,484	36,353	22,581	91,239
Bristles and Fibre	182,045	196,318	198,434	221,861	169,487	199,424
Candles	157,890	149,840	116,822	124,015	183,440	203,448
Drugs and Medicines	*138,093*	*97,732*	*155,448*	*351,502*	*172,678*	*224,778*
Senna	26,425	18,565	51,990	202,859	53,586	17,043
Nux vomica	17,366	14,556	30,760	31,137	25,112	57,606
Cinchona	8,289	9,567	8,664	11,680	564	706
Sugar	91,649	58,727	62,786	177,914	107,550	323,245
GRAND TOTAL	162,800,999	118,323,317	128,356,191	158,049,054	155,623,275	159,538,554

* For details of this trade see page 136.
† For details of this trade see Copra.

Distribution by countries.

The general distribution of exports according to the countries participating is illustrated in the table subjoined. In 1913-14 37 per cent of the exports went to the United Kingdom and British Possessions and 63 per cent to foreign countries, in marked contrast to the direction of the import trade. The latter, again, is largely derived from Europe while a feature of the distribution of exports has indeed always been the number of countries participating in it. Not more than 55 per cent is sent to European countries and the greater part of the remainder is destined for Asiatic ports, while the continents of America, Africa and Australia receive about 12, 3 and 2 per cent respectively.

TABLE No. 29.—*General distribution of the export trade shewing the shares borne by the principal countries of destination in the exports of merchandise from India in the six years ending 1918-19.*

Name of countries.	1913-14.	1914-15.	1915-16.	1916-17.	1917-18.	1918-19.
United Kingdom	23·4	31·7	38·0	33·3	25·8	29·2
Germany	10·6	5·6	..	..	..	..
Japan	9·2	8·6	9·4	11·0	14·6	12·1
United States of America	8·9	9·6	10·8	12·9	13·2	13·8
France	7·1	4·9	4·8	5·9	3·7	3·6
Belgium	4·9	2·9	·1	..	..	·004
Austria-Hungary	4·0	2·5	..	..	..	·06
Ceylon	3·7	4·2	4·7	4·4	4·1	4·2
Italy	3·2	3·8	4·5	4·0	3·6	4·0
Hongkong	3·2	2·4	2·1	1·8	1·7	2·0
Straits Settlements	2·8	2·9	2·7	2·6	2·8	2·9
China (excluding Hongkong)	2·3	2·2	2·7	2·4	1·9	1·1
Holland	1·8	·7	·1	·2	·03	·03
Australia	1·6	2·2	2·3	2·0	2·3	2·6
Russia	1·0	1·0	2·7	2·3	·3	..
Egypt	·9	1·0	1·1	1·3	10·4	6·1
Java	·8	1·0	·9	1·2	1·1	1·4
Persia	·6	·6	·9	1·3	1·4	1·3
Mauritius	·5	·8	·6	·7	·5	·5

The United Kingdom has at no time claimed such a preponderating share of India's export trade as, owing to Lancashire piecegoods and iron and steel, she has done for many years in the import trade. Germany was at the outbreak of war the principal recipient of the raw hides shipped from Calcutta and of rice from Burma, France took the bulk of the South Indian groundnut crop and Japan much of the cotton. The results of the war have been much as might have been expected. Enemy countries have of course disappeared and the

tendency has naturally been for the Allies to benefit elsewhere at the expense of neutrals. Increasing quantities of hides have gone to the United Kingdom and Italy and immense quantities of jute manufactures also to the former destination, and if Egypt figures largely in the statistics it is only as a most convenient entrepôt while war lasted, for the Allied forces operating in Italy, Salonika and Palestine.

Course of trade during 1913-19.

In this connection it may be of interest to review in somewhat more detail the course of Indian trade during the last six years. In September 1913 there had been a severe banking and commercial crisis in northern and western India. The monsoon was irregular, there being floods in Bengal and a shortage of seasonal rainfall in the United Provinces which affected the sugar crop in particular. Simultaneously the piecegoods market became seriously overstocked, the demand from upcountry being affected by famine conditions and the impaired credit and capacity for trading caused by the numerous bank failures. In the first four months of the following year, trade scarcely had time to recover from the set-back, particularly in the case of exchanges with the United Kingdom, but as the monsoon promised to be a good one an improvement was confidently looked for when the war broke out.

The outbreak of war.

It is difficult to summarise briefly the effect brought about by the outbreak of hostilities on the trade of India, but an attempt may be made to indicate the main features. At first the cessation of commercial relations with Central European powers, who had been for some time and particularly in the twelve months preceding the outbreak of war increasingly good markets for India's raw material, caused considerable dislocation. Exporters of raw cotton from Bombay and of raw jute from Calcutta lost in Germany one of their best customers. The prices of both these staple commodities fell and among articles of secondary importance which yet affect the economic conditions of a considerable community the cessation of all demands for copra from Hamburg and Bremen, created a serious situation. At the same time the exclusion of invaded Belgium and the military preoccupations of Marseilles upset for a time the oilseed trade and the trade in groundnuts in particular, while the activities of the 'Emden' in the Bay of Bengal and in the neighbourhood of the Laccadives during the first five months of the war and the menace of the 'Konigsberg' in the Arabian Sea paralysed exports generally. Further, there was a great shortage of freight due to vessels being commandeered for military transport and the inability of neutral shipping visiting Indian ports to make good all at once the elimination of the German and Austrian Mercantile Marine. The jute mills were working short time and were faced with a reduced demand for their manufactures, and were unwilling to make any large purchases of the raw material except at bargain prices. Unfortunately for the ryot of Bengal the crop that was harvested in September 1914 was unusually large and this accelerated a fall in prices of which the

mills were generally far sighted enough to take advantage, though no considerable sales for export were effected until November. It was not long, however, before the country began to adapt itself to war conditions. With the Allies entering upon an indeterminate period of trench warfare on the Western Front, an enormous demand arose for sand bags. Unlimited quantities of hides were required for the manufacture of boots for the new armies and more extensive orders from Japan for raw cotton coincided with an unusually abundant Indian crop. The Government of India found themselves the fortunate possessors of large treasury balances in August 1914 which they placed freely at the disposal of trade through the Presidency Banks and a run on deposits in the Postal Savings Bank by small depositors though severe was soon arrested. Emergency legislation was passed to strengthen the gold standard reserve and sterling exchange was supported by selling reverse Councils (sterling bills) on London up to a maximum of £1 million per week, but such measures could not do more than mitigate the effect upon India of the general disturbance of the world's exchanges and it was difficult in the first few months of the war for India to adopt with any conviction the Prime Minister's motto 'Business as usual.'

1915-16.

As the war advanced it became necessary to impose restrictions on the exports of food stuffs and articles capable of being turned to warlike uses to neutral destinations owing to the risk of their being diverted therefrom to the enemy, and to impose an embargo on certain classes of goods which might have been profitably exported owing to apprehended difficulties of replacement. The effects of Germany's ruthless submarining campaign also began to be felt particularly in the import trade. The monsoon in 1915-16 was not altogether favourable, but the export trade, in spite of the growing shortage of tonnage and an unparalleled increase in freights and insurance, did extremely well. Fresh records were established in the volume of tea, jute bags and cloth and raw wool exported, and large shipments of wheat were made on Government account.

1916-17.

In 1916-17 the value of India's overseas trade showed a noticeable increase, particularly in exports which increased by 21 per cent while imports increased by over 13 per cent. In the case of imports, however, this inflation was due to higher prices and not to any increase in volume and the exports of Indian merchandise calculated at the prices prevailing in 1915-16 were below the average for the pre-war quinquennium. The monsoon was particularly good and well distributed. Omitting sugar-cane, which does not enter into the export trade, the crops were with few exceptions better than those of the previous year and the enhancement in the prices of raw cotton, saltpetre, shellac and indigo was greatly to the benefit of Indian exporters. Jute manufacturers found themselves in the happy position of commanding higher prices for their manufactures, while the raw material was 15 per cent below the level of prices at the outbreak of war and, though the intensification of the tonnage scarcity and the financial stringency created by the curtailment of offerings

of Council bills were prejudicial to the full utilisation by exporters of the opportunities for profitable trading, the record of the trade, all things considered, must be regarded as very satisfactory.

1917-18.

The features of 1917-18 were the export of commodities of vital national importance to meet the increasing demands of the Allies and the great impetus given by necessity to India's industrial development. The share of manufactured goods in the export trade which was less than 24 per cent in 1913-14 increased to 31 per cent. Higher prices again inflated the figures given in the tables, noticeably under the head of imports. The textile industries in particular enjoyed extraordinary prosperity. There was a further fall in the price of raw jute and the decrease in the imports of cotton piecegoods encouraged considerable manufacture of better qualities of cotton cloth with higher counts of yarn in the mills of Western India.

1918-19.

The monsoon which in 1916-17 and 1917-18 had been unusually favourable was a partial failure in many parts of the country in 1918-19 and in consequence there was a great appreciation in the value of food grains which had hitherto not responded to the world-wide advance in prices. The extent of the seasonal shortage is illustrated by the fact that the rice crop was less by 12½ million tons or 35 per cent and the wheat crop 2½ million tons or 24 per cent in defect. The first half of the year was marked by great industrial activity, high prices and a good deal of unhealthy speculation particularly in the piecegoods market. The sterling value of the rupee was raised to 1*s*. 6*d*. on 12th April. The effects of the scarcity resulting from the partial failure of the monsoon had just become apparent when hostilities terminated in November. A considerable fall in freights followed, but the expectations of increased tonnage were scarcely realised. With so many adverse conditions operating in the last five months of the year, the volume of exports was 10 per cent lower than in 1917-18.

Indian Munitions Board.

No survey, however brief, of the course of India's trade during the war would be complete without a reference to the work of the Indian Munitions Board which was constituted as a new department of the Governmment of India early in 1917 with a personnel consisting in the first instance of a President and three members, to which a fourth was added in November of the same year.

The Board took over the organisation in their entirety of all Government ordnance, clothing, hide and leather factories. They assumed responsibility for the shipment of East India ' kips ' which are very largely utilised in the manufacture of leather for army boots, all available supplies of which had been purchased in India for the War Office since August 1916. The Board worked up the production of woollen and worsted goods in the existing mills to meet army requirements and provided railway track, rolling stock and plant to Mesopotamia, Egypt, East Africa, Aden and the Persian Gulf. Between July 1917 and October

1918 over 2 million pairs of boots were supplied by the Board against army demands. A Government tent factory was established and several other factories were started by private agency in different centres and supplied by the Board with the necessary raw materials. In all delivery was made of 148,000 tents by the end of October 1918. Large savings were secured to Government by centralising the purchase of jute goods in a branch directed by a Controller who was an expert in the jute trade, his operations including not only the supply of army requirements for India and Mesopotamia but also purchases on advantageous terms for Australia and the Argentine (for bagging the wheat crop). A Rivercraft branch was formed to take over the work of constructing vessels for water transport in the eastern theatres of war which had been controlled by special agency since 1916. This agency was dissolved in June 1918 when it had completed its programme of work. A timber branch shipped nearly 200,000 tons of bamboos, sawn beams, planks and scantlings to Egypt, Mesopotamia and East Africa and other places, and supplied over 30,000 tons in addition to India. The Board further controlled the distribution of the products of the Tata Iron and Steel Works at Jamshedpur in steel and pig iron and the whole output of the various cement works in India. It obtained enormous quantities of miscellaneous engineering plant and stores chiefly for Mesopotamia and East Africa and scrutinised priority applications for assistance in obtaining goods from the United Kingdom and the United States of America.

It is not too much to say that the varied activities of the Indian Munitions Board greatly helped to develop and apply to the best purpose India's resources towards the winning of the war.

Principal exports.

JUTE AND JUTE MANUFACTURES.

Jute fibre, properly so called, is obtained from two varieties of *corchorus* (*corchorus capsularis* and *corchorus olitorius*), and India enjoys a practical monopoly as virtually its sole producer. For statistical purposes, however, the fibre obtained from *hibiscus cannabinus*, which is commercially known as *Bimlipatam jute* from the Madras port from which it is principally shipped, is also included under this head.

Area and production.

Jute growing is confined almost entirely to the Ganges-Brahmaputra delta in the Presidency of Bengal and the province of Assam with the adjoining Native State of Cooch Bihar though there is some cultivation also of the plant in Bihar and Orissa. River inundation bringing down rich alluvial deposits enables the cultivator to plant this exhausting crop year after year without expenditure on manure. The plants when once established require no attention and grow to the height of 10 to 12 feet. The crop is cut before ripening and retted for about three weeks in water before the fibre can be removed by washing and beating. Machine treatment for the extraction of the fibre has never got beyond the experimental stage. Jute is generally sown from March to May and

harvested from July to September, and though it is customary in the trade to regard the season as ending on June 30th, practically the whole of the season's jute comes into sight commercially by the 31st March, when the official year closes. But the special conditions created by the war have tended to extend this period. Some idea of the importance of the pre-war trade may be gathered from the fact that in 1913-14 the total value, including India's internal consumption, of raw jute and jute manufactures, exceeded £40 millions.

TABLE No. 30.—*Estimates of the area under and production of jute in 1874, 1902, 1909 and from 1914 onwards.*

Year.	Acreage under jute.	Production* in bales (400 lbs.)
1874	not available	2,700,000
1902	not available	6,600,000
1909	2,876,600	7,206,600
1914	3,358,700	10,443,900
1915	2,375,900	7,340,900
1916	2,702,700	8,305,600
1917	2,736,000	8,864,600
1918	2,500,382	6,960,877
1919	2,821,575	8,428,023

*These figures do not include imports from Nepal which are in the neighbourhood of 60,000 bales annually, or the outturn in Madras of Bimlipatam jute, etc.

The area under jute and the yield of fibre have increased by 400 per cent in the last forty years. The average area under crop for the five years ending 1912-13 was estimated at 3,150,400 acres, which closely corresponds with that for the last pre-war year (1913-14), *viz.*, 3,169,600 acres. The conditions governing the 1918 crop were unusually unfavourable. The area sown was nearly 10 per cent in defect and much damage was done by floods. The provincial distribution of the crop and the estimated yield in 1919 are shown in the table below. In 1919 drought in March affected early sowings, but the monsoon was unusually favourable and the area under the crop was over 300,000 acres in excess of that for the previous year with an estimated increase of yield equivalent to 20 per cent.

TABLE No. 31.—*Provincial areas under jute and the estimated yield in 1919.*

Provinces.	Area (acres).	Yield (bales of 400 lbs. each).
Bengal	2,458,955	7,567,832
Bihar and Orissa	203,430	495,859
Assam	120,000	294,534
Cooch Bihar State	39,190	69,798
TOTAL	2,821,575	8,428,023

Prices.

The increasing demand for the fibre may be illustrated by a comparison of the price of raw jute in 1851, when it was the equivalent of Rs. 14½ per bale of

400 lbs., whereas in 1906 the rate was Rs. 57-8. In 1907 there was a drop in value to Rs. 50-12 which was further accentuated in 1908 and 1909, when the price declined to Rs. 39 and Rs. 32-8 per bale respectively. In 1912 the average wholesale price was Rs. 54-4 and in 1913 Rs. 71 and by April 1914 the rate had gone up to Rs. 86-8 or more than three times the price of raw jute in 1880-84. The outbreak of war not only prevented quotations from soaring still higher but gave them a severe set-back. The high prices fetched in 1913 by the cultivators and favourable agricultural conditions led to the production in 1914 of a record crop, some two million bales in excess of the world's annual consumption of jute, as estimated in normal years. The marketing of this bumper harvest could even in ordinary circumstances scarcely have been effected without a substantial decline in prices. But two important consuming countries, Germany and Austria, being closed to the trade and exports to other destinations including the United Kingdom, India's principal customer, being severely restricted, the market was completely glutted and prices sagged down to Rs. 31 in December 1914. A recovery to Rs. 41 by the following March was not sufficient to encourage cultivators, and in May there was again a decline to Rs. 37. When the final forecast disclosed that the area under raw jute had diminished by nearly one-third, rates hardened again and by March 1916 the quotation was Rs. 59. The range of prices in 1916-17, 1917-18 and 1918-19 is shewn in the following table.

TABLE No. 32.—*Wholesale price of jute* ✠ *group in Calcutta per bale of 400 lbs.*

Months.	1916-17. Rs.	As.	P.	1917-18. Rs.	As.	P.	1918-19. Rs.	As.	P.
April	57	0	0	48	0	0	41	0	0
May	56	0	0	48	0	0	39	8	0
June	54	0	0	46	0	0	37	0	0
July	48	8	0	40	0	0	43	0	0
August	51	0	0	35	0	0	50	0	0
September	58	0	0	38	0	0	74	0	0
October	55	0	0	37	0	0	75	0	0
November	55	0	0	37	8	0	78	0	0
December	55	0	0	37	0	0	76	0	0
January	53	0	0	37	0	0	77	0	0
February	52	0	0	37	8	0	76	0	0
March	50	0	0	38	0	0	70	0	0

Exports of raw jute.

The first shipment of raw jute was made apparently in 1795 but the recorded exports in 1828 were 364 cwts. only. In 1832-33, the figure rose to 11,800 cwts. and in 1838 the flax and hemp spinners of Dundee began the manufacture of jute fabrics on power looms. The handloom industry in Bengal, however, possessed such vitality that up to 1850 the exports of manufactured jute goods exceeded those of the raw material. The demand for the latter was largely increased by the cutting off at the time of the Crimean war of the United Kingdom from supplies

of Russian flax, and the exploitation of jute as a commercial fibre of the first importance dates from that epoch. In 1882-83 the exports of raw jute amounted to 517,450 tons, and the figures thereafter rose steadily until 1908-09 when they totalled nearly 900,000 tons, though the consumption in Dundee had for many years previous to the outbreak of war remained steady in the neighbourhood of 1,200,000 bales annually. In 1909-10, 730,000 tons only were shipped and in 1910-11, 635,000 but there was a pronounced recovery in 1911-12 and the following year when a total of 825,000 tons was reached. In 1913-14 the total was 768,000 tons, or about half the total crop, valued at £20,550,000 the equivalent of one quarter of all the raw produce exported from India in that year and 12 per cent of the total export trade, of which Germany and Austria together took considerably more than Dundee, whose consumption was below the normal.

TABLE No. 33.—*Distribution and total value of the export trade* according to countries from 1913-14 onwards.*

Countries.	1913-14 bales.	1914-15 bales.	1915-16 bales.	1916-17 bales.	1917-18 bales.	1918-19 bales.
United Kingdom	1,626,067	1,487,248	1,896,501	1,457,271	379,680	1,255,075
Germany	886,928	168,174	..	..	..	..
United States	659,366	454,244	597,145	692,798	527,570	342,882
France	407,165	191,492	165,978	251,087	157,920	240,593
Austria-Hungary	256,072	64,882	..	..	..	..
Italy	211,512	232,433	340,144	215,325	138,830	149,144
Spain	118,613	140,745	201,385	211,080	194,880	73,113
Other countries	137,603	89,314	159,479	195,139	158,480	168,907
TOTAL Bales	4,303,326	2,828,532	3,360,632	3,022,700	1,557,360	2,229,617
TOTAL Tons	768,451	505,095	600,113	539,768	278,100	398,146
TOTAL Value £	20,550,929	8,606,802	10,428,024	10,858,736	4,302,559	8,480,052

Before the war Germany, where the fibre is used in the manufacture of blankets, cheap carpets, etc., was next to the United Kingdom, India's best customer for raw jute. Her normal requirements were in the neighbourhood of 800,000 bales annually and 250,000 went to Austria-Hungary, and the trade did not at first make good the gap caused by the disappearance of these important markets. In 1914-15 exports to all destinations, except to Italy and Spain, shew a considerable decline. The 1915 crop was a small one, but in 1915-16, when it came commercially into sight, the volume of exports increased from 2,828,000 to 3,360,000 bales, the United Kingdom, the United States, Italy and Spain all receiving increased quantities.

The estimated yield of the crop in 1916 was considerably higher but owing chiefly to the conditions created by the war the volume of exports was 10 per cent less in 1916-17 than in the previous year. At the same time the range of prices was so much higher that the value increased

* Including Bimlipatam jute.

from £10,428,000 to £10,859,000. From February 1917 onwards exports were prohibited to all destinatons, including the United Kingdom except under a license granted by the Chief Customs officer at the port of export and the total exports in 1917-18 amounted only to 278,000 tons, the lowest for forty years. Of this 94,200 tons went to the United States and only 67,800 tons to the United Kingdom, about a fifth of her pre-war quinquennial average. Brazil and Japan imported considerably larger quantities than in 1916-17.

The control over exports was partially removed in March 1919 and with effect from the 18th October disappeared altogether.

Commercial organisation.

Between the cultivator of jute and the shipper many middlemen intervene. The cultivator disposes of his jute to a *bepari* or petty dealer who has received advances from a *mahajan* or broker (also known as *arathdar*) on the understanding that he gets as much jute as he can for the latter. The intervention of the *bepari*, if not that of the *mahajan*, between the cultivator and the wholesale buyer is unavoidable because the individual holdings are generally very small. The *mahajan* sells to the big buyer who may be the representative of a large exporting firm or of a mill, a baler or another broker, by whom the preliminary sorting, grading and bulking are effected. The most important trade centre upcountry for raw jute is at Narayanganj. Raw jute is transported by river or rail to Chittagong and Calcutta. The imports into Calcutta of raw jute in 1918 by rail and river amounted to nearly 800,000 tons. The bulk of the jute for Calcutta is despatched in *kutcha* bales. Jute, unlike cotton, loses only an insignificant percentage of its weight in the processes of cleaning and baling.

The raw jute market in Calcutta is operated by brokers who sell either to the mills or to balers who may or may not be exporters also. In 1917-18 the number of jute presses in Calcutta and the neighbourhood amounted to 32. All jute is baled for export, the unit of sale as well as of shipment being the bale of 400 lbs. though sterling quotations are usually on the basis of a ton, *c. i. f.* Brilliant colour, glossiness and length are the characteristics of good jute. Some mills prefer hard and some soft fibre. Though a number of grades are recognised, such as *uttariya, deswal, daisee* (the standard quality), *deora*, etc., traders' marks play a very important part in the business, while *Narayanganji* and *Serajganji* are fibres named after the localities whence they are obtained. The lowest qualities are sold as *rejections* while *cuttings* represent the hard and woody ends of the plants.

Jute manufactures.

The first power mill in India to spin jute started work at Rishra near Serampur in 1855 and the first weaving mill at Baranagore four years later and the industry progressed steadily until 1875 when there was a temporary set-back owing to a too rapid increase in the number of looms. Since then the record is one of almost uninterrupted progress. Hand weaving has in consequence altogether died out, but the hand spinning of jute twine is still carried on as a cottage industry throughout the jute growing districts. The product of the mills is now about 3,000 tons a

day and the consumption of raw jute in Indian mills is five times that of Dundee and two-thirds of the total production of jute in India, the actual figures for consumption in 1918-19 being 5,000,000 bales out of an estimated total crop of 6,960,800 bales. The number of jute mills in India has increased since 1870 from 5 to 76, and the number of looms from 1,250 to 39,300. Practically all the mills are in the neighbourhood of Calcutta, on the banks of the Hooghly for convenience of cheap water transport, the only mills outside Bengal being three in the Madras Presidency utilising *hibiscus cannabinus* only. While the chief products of the mills in pre-war times were gunnies and hessian cloth, military demands have since given an impetus to the conversion of the latter into sandbags and to a largely increased output of tarpaulins. But perhaps the most interesting war development is the manufacture of jute canvas, when the Russian revolution once more closed the principal European flax market to Great Britain and France. Over 5,000,000 yards have been made by the Calcutta mills in 1918.

Progress of the industry.

The record of the jute industry in Bengal has been, as has been stated, one of almost uninterrupted progress. In the following table, the quinquennial averages from 1879-80 to 1908-09 for mills, capital, persons employed, looms and spindles are supplemented by actuals for the last ten years, while the figures in brackets represent the variations for each period taking the average for the first quinquennium as 100.

TABLE No. 34.—*Table to illustrate the expansion of the jute industry from 1879-80.*

Year.	No. of mills at work.	Nominal capital in lakhs of Rs.	Number (in thousands) of		
			Persons employed.	Looms.	Spindles.
1879-80 to 1883-84	21 (100)	270·7 (100)	38·8 (100)	5·5 (100)	88·0 (100)
1884-85 to 1888-89	24 (114)	341·6 (120)	52·7 (136)	7·0 (127)	138·4 (157)
1889-90 to 1893-94	26 (124)	402·6 (149)	64·3 (166)	8·3 (151)	172·6 (196)
1894-95 to 1898-99	31 (148)	522·1 (193)	86·7 (223)	11·7 (213)	244·8 (278)
1899-1900 to 1903-04	36 (171)	680·0 (251)	114·2 (294)	16·2 (295)	334·6 (380)
1904-05 to 1908-09	46 (219)	960·0 (355)	165·0 (425)	24·8 (451)	510·5 (580)
1909-10	60 (286)	1,151·0 (425)	204·1 (526)	31·4 (571)	645·9 (734)
1910-11	58 (276)	1,150·0 (424)	216·4 (558)	33·1 (602)	682·5 (776)
1911-12	59 (281)	1,193·0 (441)	201·3 (519)	32·9 (598)	677·5 (770)
1912-13	61 (290)	1,196·5 (442)	204·0 (525)	34·0 (618)	708·7 (805)
1913-14	64 (305)	1,309·2 (486)	216·3 (557)	36·0 (654)	744·3 (846)
1914-15	70 (333)	1,394·3 (515)	238·3 (614)	38·4 (698)	795·5 (904)
1915-16	70 (333)	1,322·5 (488)	254·1 (655)	39·9 (725)	812·4 (923)
1916-17	74 (352)	1,402·4 (517)	262·5 (676)	39·6 (720)	824·3 (937)
1917-18	76 (362)	1,428·4 (528)	266·0 (685)	40·6 (738)	834·0 (948)
1918-19	76 (362)	1,447·2 (536)	270·0 (710)	39·3 (710)	823·7 (936)

Exports of jute manufactures.

At the beginning of 1914 raw jute commanded abnormal prices—the price of ✡M group bales being Rs. 82, in Calcutta and of first marks in London £36 per ton. When war broke out these rates had declined to Rs. 50—55 and £27-10, and when the forecast issued in September indicated an unusually large crop, prices sagged badly of which the mills, with anticipation of a considerably enhanced demand for military requriements, took advantage to secure large stocks of the raw material at extremely favourable rates. As the war proceeded, the submarine menace and the consequential shortage of freight emphasized the importance of shipping manufactured goods in all cases where manufacture was possible in India in order to economise tonnage. During 1914-15 the exports of jute manufactures from India amounted in value to nearly £17⅓ millions representing about 56 per cent of the total value of exports of the articles wholly or mainly manufactured and about 15 per cent of the total exports of Indian merchandise. There were large increased shipments to the United Kingdom. Russia (*viâ* Vladivostock) bought heavily and also Japan, but Australia's demands were reduced owing to the partial failure of the wheat harvest.

The prosperity of the industry was enhanced in the following year (1915-16) owing to increased war demands from France and Russia as well as from the British Government. Labour was plentiful and while the price of gunnies rose steadily the mills were in the fortunate position of being able still to command unlimited quantities of cheap jute. As regards the direction of the trade, 46 per cent of the gunny bags exported went to the Allies and of the gunny cloth 52 per cent to the United States of America and 16 per cent to the United Kingdom.

In 1916-17, the foreign exports of jute manufactures amounted to 788,600 tons and the value of the trade rose to the unprecedented total of nearly £28 millions. 43 per cent of the gunnies went to the United Kingdom, while the United States of America took 56 per cent of the cloth exported and the Argentine Republic 11 per cent.

One of the main features of the export trade in 1917-18 was the rise in the price of the manufactured article, though the price of the raw material was even lower than in the previous year and consequently though there was some decrease in the volume shipped, values rose by 3 per cent to £29 millions, a figure which is more than double the average value of the exports in the quinquennium preceding the war. Larger quantities of bags went to the United States, the Argentine, Japan, Egypt and South Africa but less to the United Kingdom and two-thirds of the total quantity of cloth was exported to the first named destination.

The year 1918-19 was one of unparalleled prosperity for the Indian jute mills in spite of a rise in the price of the raw material towards its close, owing to a short crop of indifferent quality and an unsettled business outlook. Exports of jute manufactures were freely licensed, and with

enhanced prices everywhere prevailing, the total value exceeded £35 millions. Of private shipments Australia, the United States, Chile, Java and Indo-China were the best customers for bags and for cloth the United States of America, the Argentine, the United Kingdom and Canada in that order.

In pre-war times the quantity of raw jute exported was nearly equal to the consumption in Indian mills. Now the latter is, as the table below shows, nearly thrice as great as the former.

TABLE No. 35.—*Mill consumption and exports of raw jute from 1913-14.*

Period.	Mill consumption. (1,000 bales.)	Export. (1,000 bales.)
Season ending June 30th, 1914	4,374	4,310
" " 1915	4,944	3,046
" " 1916	5,770	3,157
" " 1917	5,678	2,840
" " 1918	5,447	1,756
" " 1919 (estimated)	5,000	2,210

Mill consumption in 1918-19, would, it was anticipated, have reached 6 million bales but after the armistice short time working was again introduced. The greatly increased output of jute manufactures in India is further emphasized by the export returns.

TABLE No. 36.—*Values, percentages and totals of raw and manufactured jute exported in 1913-14 and 1918-19 contrasted.*

Articles.	1913-14.		1918-19.	
	Value.	Percentage.	Value.	Percentage.
	£		£	
Jute— Raw	20,551,000	52·7	8,480,000	19·5
Manufactures	18,849,000	47·3	35,101,000	80·5
TOTAL	39,400,000	100	43,581,000	100

Bengal accounted for 99 per cent of these exports in 1918-19, the entire quantity being shipped from Calcutta. Details of the manufactures exported are given below.

TABLE No. 37.—*Details of jute manufactures exported in 1913-14 and in 1918-19.*

Manufactured articles.		1913-14.		1918-19.	
No. of bags		368,759,000		583,096,000	
Weight	Tons		325,700		382,500
Yards of cloth		1,061,152,000		1,103,211,000	
Weight	Tons		275,200		292,100
Miscellaneous goods weight	„		4,200		7,000
TOTAL WEIGHT	„		605,100		681,600
Value of bags	£	8,353,000		14,889,000	
„ cloth	£	10,396,000		19,796,000	
„ miscellaneous goods	£	99,000		416,000	
TOTAL	£	18,849,000		35,101,000	

Government buying operations.

Towards the end of 1916 the Director-General of Commercial Intelligence was appointed Jute Commissioner in Calcutta to effect the purchases of raw jute for the Dundee mills by the various firms among whom the orders were distributed on the basis of their previous Dundee business. This arrangement which effected considerable economies was terminated in 1917 when a new scheme was introduced involving purchase in London from selected firms. An officer designated Jute Controller was subsequently entrusted with the placing out of contracts in India for the purchase of jute manufactures for army requirements at controlled rates which are calculated to have effected a saving to the Indian and Australian Governments of £1½ millions in 1918 alone. The record of Government orders placed on behalf of the British Indian, Australian and Allied Governments since 1915-16 is shown in the table below. Early in 1918 there was also effected a quick shipment of 4 million wheat bags to America on account of the U. S. A. Food Administration.

TABLE No. 38.—*Government orders placed for jute manufactures in 1915-16, 1916-17, 1917-18 and in 1918-19.*

Year.	Bags.	Cloth in yards.
1915-16	272,000,000	41,000,000
1916-17	403,000,000	148,000,000
1917-18	498,000,000	267,000,000
1918-19	205,000,000	257,000,000
TOTAL	1,378,000,000	713,000,000

Actual shipments in 1918-19 amounted to 221 million bags and 269 million yards cloth, as compared with last year's totals of 391 million bags and 205 million yards cloth. Of the bags 132 million went to the United Kingdom; 74½ million to Egypt 'for orders;' 7½ million to Italy; and 7 million to the Argentine for bagging wheat purchased by the Royal Commission on Wheat Supplies. Of the cloth, 113½ million yards went to the United Kingdom, 80½ million yards to the Argentine and 66 million yards to France, which took practically no bags. Somewhat better rates were paid in view of the high price of the raw material, but the increase was in no way comparable to the big advance in values of exports on private account.

The trade names of the principal jute manufactures with their sizes, weight and texture are given below. The terms 'porter' and 'shot' correspond to warp and weft.

TABLE No. 39.—*Size, weight and texture of the principal jute manufactures exported.*

Description.		Breadth and length.	Weight.	Porter & shot.
Twill Corn-sacks	Bags	41″×23″	2¼ lbs.	8″× 9″
A. Twills	„	44″×26½″	2⅝ „	8″× 9″
Liverpool Twills	„	44″×26½″	2½ „	8″× 8″
No. 2 Twills	„	44″×26½″	2½ „	6″× 8″
B. Twills	„	44″×26½″	2¼ „	6″× 8″
Grain sacks	„	60″×30″	5 „	6″× 8″
Cuban Sugar Twills	„	48″×29″	2½ „	8″× 8″or 7″×9″
Sugar Twills	„	48″×28″	2½ „	6″× 8″
Heavy C's.	„	40″×28″	2¼ „	8″× 9″
Light C's.	„	40″×28″	2 „	8″× 8″or 7″×9″
K. Bags	„	40″×28″	1⅞ „	6″× 8″
Flour Bags	„	56″×28″	2½ „	8″× 8″or 7″×9″
Salt Bags	„	45″×26″	1¾ „	6″× 8″
E. Bags	„	40″×28″	1¾ „	5″× 8″
Hessian Cloth		40″	*8 oz.	9″×10″
„ „		40″	*10½ „	11″×12″
Fine twill sacking cloth		22″	*14 „	10″×12″
Twilled sacking		22″	*14 „	8″× 8″
Twill sacking cloth		27″	*16 „	8″× 8″or8″×9″
Twilled sacking		28″	*16 „	6″× 8″
Twill sacking cloth		29″	*24 „	8″× 9″

* Per yard.

Export duty.

With effect from the 1st March 1916 the Government of India decided to levy an export duty on raw jute other than cuttings at a general rate of Rs.2-4-0 per bale of 400 lbs. equivalent approximately to an *ad valorem* duty of 5 per cent. The duty on cuttings was fixed at 10 annas per bale.

Simultaneously an export duty of Rs. 16 per ton was imposed on hessians and Rs. 10 per ton on sacking, corresponding to the raw jute rate on the material used in the manufacture of each class of goods. With effect from 1st March 1917 these rates were doubled, and now stand at Rs. 4-8-0 and Re. 1-4-0 for raw jute and cuttings and Rs. 32 and Rs. 20 for hessians and sacking respectively. These duties are not

applicable to Bimlipatam jute. The amount realized by this duty in 1918-19 was £1,428,000.

The question of legislating to prevent adulteration, particularly by watering, of raw jute tendered for export has been frequently discussed and in 1916 the Bengal Government went so far as to draft a bill to deal with the evil but in the face of the opinion generally held in commercial circles that it would prove unworkable, the measure was never proceeded with.

Bimlipatam jute—(1) Raw.

Though there is no true jute (*corchorus*) grown outside the old Presidency of Bengal and Assam, there is considerable cultivation in the Bombay and Madras Presidencies of *hibiscus cannabinus* which yields a fibre which is very similar and can be put to practically the same uses. This fibre, which is known as Deccan hemp in western India figures more prominently in the export trade under the name of Bimlipatam jute from the port on the Bay of Bengal from which it is chiefly shipped. The area under *hibiscus cannabinus* in the Bombay Presidency is about 90,000 acres and in Madras between 70,000 and 80,000 acres. In Bombay it is chiefly found in the Deccan and Karnatak and in Madras, in the Vizagapatam and Nellore districts. The normal outturn in Madras may be taken at about 700 to 800 lbs. of dry fibre per acre, the percentage of fibre to dry stalks being about 16. The chief ports of export are Bimlipatam, Vizagapatam and Cocanada with percentage shares of 58, 32 and 5 respectively. The following table illustrates the course of the export trade which, lacking the organisation of the Bengal jute industry and dependent upon an uncertain and diminishing steamer service at the three non-terminal ports, was greatly curtailed while the war lasted.

TABLE No. 40.—*Exports of Bimlipatam jute (raw) from Madras ports.*

Year.	Quantity.	Value.
	Tons.	£
1913-14	22,003	517,992
1914-15	6,822	94,859
1915-16	5,867	84,002
1916-17	6,090	112,268
1917-18	32	551
1918-19	2,376	60,750

The principal pre-war destinations were the United Kingdom (67 per cent) and France (8 per cent) but in 1913-14 Germany took 5,000 tons equivalent to very nearly 25 per cent of the whole. The shipments of the same fibre from Bombay are not separately distinguished. The season for shipments in Madras usually runs from January to April and the unit of shipment is the steam-pressed bale of about 400 lbs. rope lashed.

Though there are three factories in the Madras Presidency which deal with this fibre, the principal one being at Chittivalsa near Bimlipatam, the exports of manufactures are inconsiderable. There is a good local demand for the bags which compete with gunnies of similar texture from Calcutta mills. There are no mills manufacturing Deccan hemp in Bombay.

(2) Manufactures.

RAW COTTON.

Production.

According to the average of the last five years the exports of raw cotton represent 33 per cent of the total value of raw materials exported from India. The extent of the trade depends primarily of course upon the exportable surplus which in turn depends upon the general harvest in India, but the relation of textile activity in Europe and the United States to the supplies available in America and Egypt has such an important bearing upon the prices as to be a factor of scarcely less importance.

The world's production of cotton in pre-war times was estimated by Professor Todd, Secretary of the Empire Cotton Committee, at 26½ million bales, and the United States of America with an annual production of 15 million bales was the dominating factor in the market. The mill consumption in the United States which averaged only 5,769,000 bales out of 14,558,000 in the quinquennium 1910–15, leaving an exportable surplus of 8,789,000 bales, rose to an average of 7,600,000 bales in the next triennium against a reduced crop of 12,872,000 bales, which means an exportable surplus of 5,272,000 bales only, and the amount available for the world's consumption is reduced by 3½ million bales.

The view has for some time been held that the production of cotton has scarcely kept pace with the increasing demand for cotton cloth, and it will be necessary for Lancashire in particular, if she is to maintain her place as a manufacturer of cotton goods to tap fresh sources of supply. In this connection no country in the world offers such potentialities for making the additional contributions to the world's cotton crop which are necessary to restore equilibrium as India, but the problem is complicated by the doubt to what extent Indian short staple will really relieve the situation, even if, without any increase in the area cultivated, reliance upon more prolific types of plant, better agricultural practice and a more liberal use of fertilisers were to guarantee the proportionate increase in outturn which the situation demands. This problem was one of those referred to and considered by the Indian Cotton Committee whose report has just been published, and their survey of the present position of the Indian cotton crop is summarised in the following paragraphs.

The area under cotton in India covers such a wide climatic range that the season for planting and picking are divergent in different parts of the country and while in the Punjab and Sind the crop is almost entirely irrigated, elsewhere it depends for the most part upon the sufficiency and timeliness of the monsoon rainfall.

TABLE No. 41.—*Acreage and yield in bales of 400 lbs. each of cotton in each province from 1915-16 onwards.*

	1915-16.		1916-17.		1917-18.		1918-19.	
	Area.	Yield.	Area.	Yield.	Area.	Yield.	Area.	Yield.
Bombay (including Sind and Indian States)	5,166,000	1,099,000	7,277,000	1,724,000	8,878,000	1,695,000	6,150,000	766,000
Central Provinces and Berar	4,061,000	1,106,000	4,402,000	691,000	4,582,000	591,000	4,211,000	789,000
Hyderabad State	2,964,000	450,000	3,200,000	500,000	3,451,000	450,000	2,406,000	350,000
Madras (with Native States)	2,061,000	245,000	2,168,000	347,000	2,592,000	450,000	3,118,000	633,000
Central India States	999,000	216,000	1,419,000	311,000	1,454,000	116,000	1,233,000	216,000
Punjab (with Native States)	902,000	195 000	1,163,000	335,000	1,800,000	307,000	1,541,000	493,000
United Provinces (with Rampur)	834,000	262,000	1,185,000	309,000	1,315,000	198,000	863,000	175,000
Rajputana States and Ajmer-Merwara	267,000	64,000	381,000	163,000	505,000	68,000	280,000	69,000
Burma	187,000	27,000	223,000	40,000	247,000	48,000	347,000	78,000
Bengal, Bihar and Orissa and Assam (with Native States).	187,000	56,000	173,000	47,000	172,000	49,000	185,000	61,000
Mysore	92,000	14,000	126,000	16,000	154,000	23,000	124,000	31,000
North-West Frontier Province (with Tochi and Kurram Agency).	26,000	4,000	28,000	6,000	38,000	5,000	39,000	10,000
TOTAL	17,746,000	3,738,000	21,745,000	4,489,000	25,188,000	4,000,000	20,497,000	3,671,000

The area and yield in 1913-14 and 1914-15 were 25,023,000 acres and 5,065,000 bales and 24,595,000 acres and 5,209,000 bales, respectively. The average yield per acre in India is between 75 and 100 lbs. of lint cotton only, as compared with 180 lbs. in the United States of America and 360 to 400 lbs. in Egypt.

In the last pre-war year the value of the Indian cotton crop was estimated at £49½ millions or 15 per cent of the world's total crop. In 1918-19 with the price of good Broach above 13*d.*, the value of the reduced crop gathered cannot be less than £76 millions.

Bombay Presidency.

The average area under cotton in the Bombay Presidency, including Sind and Native States cropped during the five years ending 1918-19 was 7,073,000 acres of which the share of Bombay was 3,884,000 acres, of Baroda 769,000 acres and of Sind 256,000 acres.

No separate figures are available for the production of Lancashire long staple cotton or of Bombay standard* long staple in the Presidency, though considerable areas are devoted to both.

Cotton growing tracts in the Presidency fall into five divisions —

(*i*) the area comprising the greater part of North Gujarat, the adjoining tracts of the Baroda State and the greater portion of Kathiawar where the trade variety *Dholeras* is produced ;

(*ii*) Southern Gujarat, including the Broach and Surat districts in British territory and the Navsari District in Baroda where *Broach* cotton, the barometer of the Indian cotton trade, is grown ;

(*iii*) the Bombay Deccan including the districts of East and West Khandesh, Nasik, Ahmednagar and Sholapur, also the northern part of the Bijapur District of the Hyderabad State where *Khandesh* cotton is cultivated ;

(*iv*) the Karnatak, comprising the districts of Dharwar, Belgaum and the greater part of Bijapur as well as the Native States of Kolhapur and Sangli whence *Kumpta-Dharwar* is obtained ; and

(*v*) the territory to the left of the Indus in Sind in the Nawabshah, Thar and Parkar and Hyderabad districts where *Sind* cotton is raised. In parts of the Bijapur District *westerns* are also grown as in the Madras Deccan.

Trade classification.	Staple in inches.	Ginning percentage.	Acreage.	Average outturn (in bales of 400 lbs. each).
Khandesh— Khandesh *roseum*, etc.	3/8″ to 4/8″	38	2,005,000	396,000
Dholeras— Wagad, etc.	6/8″ to 7/8″	33	2,100,000	585,000

* In Bombay any cotton actually measuring ¾″ or over is long staple, but the Lancashire standard is a commercial inch or more correctly, cotton exceeding ⅞″.

Trade classification.	Staple in inches.	Ginning percentage.	Acreage	Average outturn (in bales of 400 lbs. each).
Broach—				
Navsari	7/8″ to 1″	31	1,210,000	280,000
Surat, etc.	7/8″	32		
Kumpta-Dharwar—				
Kumpta-Dharwar . .	7/8″	26	1,200,000	240,000
American Dharwar .	6/8″ to 7/8″	30	250,000	55,000
Westerns	6/8″	25	500,000	65,000 (including Hyderabad).
Sind	3/8″ to 5/8″	35	245,000	67,000

Raw cotton accounted for 42 per cent of the total exports of Indian merchandise from the Bombay Presidency in 1918-19, the total quantity shipped being about 915,000 bales of 400 lbs. each.

Central Provinces and Berar.

During the five years ending 1918-19 the average area cropped was 4,393,000 acres equivalent to 20 per cent of the total for India, which is a higher percentage than that in any other province. In 1918-19 the total acreage was 4,211,000.

Of the total crop, about 2,000 bales of *bani* cotton when marketed pure and about 500 bales of *buri* are equal to Lancashire staple. The rest are all short staple cotton. Commercially they are all classified as *Oomras*. The most important tracts are the four districts of Berar and the adjacent districts of Nimar, Wardha and Nagpur, the main varieties produced being (*i*) the *Berar and Central Provinces* type in Berar and western part of Central Provinces, (*ii*) *roseum* in Berar and the adjoining tracts, (*iii*) *bani* in the Hinganghat District and as a cold weather crop in the Chanda District. The acreage under *buri* does not exceed 2,000.

Trade classification.	Staple in inches.	Ginning percentage.	Acreage.	Average outturn (in bales of 400 lbs. each).
Oomras—				
Berar and Central Provinces.	5/8″ to 6/8″	35	3,700,000	571,000
Roseum	4/8″ to 5/8″	40	700,000	180,000
Bani	1″ to 1⅛″	25	10,000	2,000

Hyderabad.

The area under cotton for the five years ending 1918-19 averaged 3,125,000 acres. In 1918-19, the acreage was 2,406,000.

Of the total crop realised, nearly 160,000 bales, if marketed pure, is up to Lancashire standard.

Two main varieties of cotton are cultivated—*buri* and *bani*, which both come under the trade description of *Oomras*. *Buri* is said to predominate in the Adilabad, Nizamabad and Karimnagar districts, while *bani*, alternatively known as *Hyderabad Gaorani*, is the most important variety in the west, particularly in Parbhani and Nander. In Raichur and south of Gulbarga the *westerns* cotton of Madras are found, while south-east of Warangal, *Cocanadas* are grown and as a mixed crop *Khandesh* also.

Trade classification.	Staple in inches.	Ginning percentage.	Acreage.	Average outturn (in bales of 400 lbs. each).
Bani (Hinganghat Barsi or Gaorani).	1 to 1⅛	29	830,000	166,000
Buri	7/8″ to 1″	31	115,000 acres are returned, but this is probably Berar cotton with a large mixture of upland American and is included in No. 3 below.	
Khandesh	4/8″ to 5/8″	32	} 530,000 mixed with *bani*, 115,000 mixed with *buri*.	
Westerns	6/8″	25	500,000	65,000 (including Bombay).
Cocanadas	5/8″ to 7/8″	23	No separate figures available.	

Madras.

For the quinquennium ending 1918-19, 2,388,000 acres on an average were under cotton in the Madras Presidency exclusive of 22,000 acres in the Native States. Of the total crop about 500,000 bales, equivalent to a half, comes under the Lancashire definition of long staple and practically the whole of the remainder except *Cocanadas* is long staple cotton as defined by the Bombay cotton trade.

The cotton growing tracts in Madras fall into three well-marked divisions—

(*i*) the Deccan table land including the districts of Bellary, Anantapur, Kurnool and Cuddapah in which the *northerns* and *westerns* are grown, the former chiefly in the two first named and the latter chiefly in the two last named districts;

(*ii*) the Coromandel Coast including the uplands of Guntur, Kistna, Nellore and Godavari (of which the first named is much the most important) where *Cocanadas* are grown; and

(*iii*) the southern districts of Tinnevelly, Ramnad, Madura, Trichinopoly and Coimbatore where (1) *Cambodia* (a variety of American upland, the seed of which was obtained direct from Cambodia about 1905) is grown on red soils, preferably well irrigated, and (2) *Tinnevellies* of which pure *karunganni*, a variety selected by the Agricultural Department, is much the most important variety grown on the black soils.

Uppam cotton grown in the Coimbatore and Trichinopoly districts (and to a small extent in Salem) passes under the trade name of *Salems*.

Trade classification.	Staple in inches.	Ginning percentage.	Acreage.	Average out-turn (in bales of 400 lbs.)
Northerns	7/8″	27	439,000	65,000
Westerns	6/8″	25	650,000	85,000
Cocanadas	5/8″ to 7/8″	23	261,000	40,000
Tinnevellies—				
Karunganni	7/8″	32	220,000	50,000
Tinnevellies	6/8″ to 7/8″	27	320,000	84,000
Cambodia—				
Irrigated	6/8″ to 1⅛″	30 to 33	188,000	100,000
Unirrigated	5/8″ to 7/8″	30 to 33	283,000	100,000
Salems—				
Uppam	6/8″	25	154,000	27,000

Raw cotton accounts for 16 per cent. of the total exports of merchandise from the Madras Presidency. It has been calculated that on an average about 360,000 bales are available for export.

The Punjab.

For the five years ending 1918-19, the average area under cotton in the Punjab was 1,453,000 acres inclusive of 129,000 acres returned by Native States. The fall in prices on the outbreak of war led to a reduction in the acreage in 1915-16 to 902,000, but this was more than made good in the following year. Seventy-five per cent. of the crop is ordinarily under irrigation and nearly a fourth of the cotton grown is of Lancashire staple.

Three tracts may be distinguished: (*i*) the territory lying north-west of a line drawn from Ambala to Hissar where *Sind-Punjab* cotton is cultivated; (*ii*) the Punjab Canal colonies in the districts of Lyallpur, Montgomery, Jhang, Shahpur, Gujranvala and Multan where *Punjab American* is grown under irrigation; and (*iii*) the territory south of a line from Hissar to Ambala where a variety of *Bengals* known as *South-East Punjab* is grown.

Trade classification.	Staple.	Ginning percentage.	Acreage.	Average out-turn (in bales of 400 lbs.)
(1) Sind Punjab	4/8″	33	1,400,000	330,000
(2) Punjab American	7/8″	32 to 33	276,000	100,000
(3) Bengals (S. E. Punjab)	4/8″	35	309,000	100,000

United Provinces.

For the quinquennium ending 1918-19 the average acreage under cotton was 1,137,000 exclusive of 12,000 acres in Native States. In 1918-19 the area was 863,000 acres including the State of Rampur.

Practically the whole of the cotton of the province is sold under the commercial name *Bengals* with a staple of 3/8″ to 4/8″ for ordinary

Bengals and of 4/8″ to 5/8″ for fine *Bengals*. Only 500 bales of Lancashire staple are at present produced.

Though grown all over the provinces, the chief areas for cotton lie in the west in the Bulandshahr, Muttra, Aligarh and Agra districts. About one-third of the total crop is irrigated. The chief varieties are the (1) *United Provinces*, (2) *white flowered Aligarh* (a variety selected by the Agricultural Department) and (3) *Cawnpore-American* (grown only in canal irrigated areas).

Trade classification.	Length of staple.	Ginning percentage.	Acreage.	Average out-turn (in bales of 400 lbs.)
Bengals—				
United Provinces	4/8″ (average)	35 (average)	1,120,000	290,000
White flowered Aligarh	3/8″	39	120,000	24,000
Cawnpore-American	7/8″ to 1″	31	2,000	500

Central India.

For the five years ending 1918-19, the area under cotton in the Central India Agency averaged 1,325,000 acres. Of this Indore contributed about 441,000 acres, Gwalior 471,000 acres and Bhopal 145,000.

About 7 per cent. of the crop, *viz.*, *Malwa* cotton, if marketed pure, comes under the description of Bombay staple. The main cotton growing tract is the southern part of the western of the two detached areas of which the Agency is composed. *Malwa* cotton is grown on the Malwa plateau and elsewhere, the type known as *Central India*, both of which belong to the trade description *Oomras*. The estimated output is about 320,000 bales.

Rajputana and Ajmer-Merwara.

In Rajputana the average area under cotton for the five years ending 1918-19 was 334,000 exclusive of 46,000 acres in Ajmer-Merwara.

No long staple variety of cotton is produced. The cotton tracts of the Agency are in the east adjacent to those of the United Provinces and Central India. The cotton which belongs to the type known as *Rajputana* falls under the trade classification of *Bengals*.

Mysore.

The average area under cotton for the five years ending 1918-19 in Mysore was 121,000 acres. Most of the cotton grown satisfies the Lancashire definition of long staple. The chief areas are the Chitaldrug and Shimoga districts, where the types of the adjoining districts of Bombay are produced, *viz.*, *Kumpta and Dharwar-American*. But no separate statistics are available for them.

Burma.

During the five years ending 1918-19, the average area in Burma under cotton was 254,000 acres.

The whole crop is of short staple with the possible exception of *wa-gyi* which can be brought under the Bombay description if a regular staple

can be evolved. The five chief districts, Thayetmyo, Sagaing, Lower Chindwin, Meiktila and Myingyan in the dry zone, are devoted chiefly to *wa-gale* cotton which forms nearly seven-eighths of the crop.

On the borders of the dry and wet zones in the Thayetmyo and Prome districts *wa-gyi* cotton is cultivated and in the Shan Hills, the type *Shan Hills*. Collectively the three varieties are called *Burmas*.

Trade classification.	Staple in inches.	Ginning percentage.	Acreage.	Average out-turn (in bales of 400 lbs.)
Burmas—				
Wa-gale . . .	5/8″ to 6/8″	30	246,000	54,000
Wa-gyi . . .	6/8″	39 to 40		
Shan Hills . . .	1″	25		

Exports of raw cotton from Burma formed 8 per cent. of the total exports of merchandise from the province in 1918-19, the actual quantity being over 53,700 bales of 400 lbs. each.

Bengal, Bihar and Orissa and Assam.

For the five years ending 1918-19 the average area under cotton in Bengal was 59,000 acres, in Bihar and Orissa 70,000 acres and in Assam 33,000 acres. In Bengal the chief producing areas are the Chittagong hill tracts, the districts of Bankura and Midnapore and in Assam, the Garo and Lushai hills. The product of these areas is known as *Comilla* cotton. The acreage in Orissa is insignificant. In Bihar, the districts of Saran and the Santhal Parganas have more than 10,000 acres devoted to the crop, and with the Ranchi District they produce the cotton called *Bihar and Orissa*. A variety known as *Jathia* is found in scattered parts of Bihar and Orissa.

Trade classification.	Staple in inches.	Ginning percentage.	Acreage.	Average outturn (in bales of 400 lbs. each).
Comillas	3/8″ to 4/8″	45	98,000	30,000
Jathia	5/8″ to 6/8″	17	Figures not	available.
Bihar and Orissa	3/8″ to 4/8″	34	74,000	17,000

The exports of raw cotton from Calcutta in a normal year amount to about 85,000 bales.

North-West Frontier Province.

For the five years ending 1918-19 the average acreage under cotton was 38,000 acres. The bulk of the crop is grown under irrigation in the Peshawar and Dera Ismail Khan districts and is known in the trade as *North-West Frontier Province*. Its ginning percentage is 32, and as the length of its staple is only from 5/8″ to 6/8″, it scarcely satisfies the Bombay standard of long staple.

In the following table the average prices of typical grades of cotton on the Liverpool and Bombay markets are contrasted.

TABLE No. 42.—*Average prices of American middling cotton at Liverpool and good Broach cotton at Bombay during the last ten years, in pence and decimals of a penny per lb.*

Year.	Liverpool.	Bombay.
	d.	*d.*
1908	4·25	5·04
1909	5	4·9
1910	6	6·1
1911	6	6·9
1912	5·75	5·6
1913	5·83	6·3
1914	4	5·9
1915	4·50	4·2
1916	6	5·9
1917	16·66	9·4
1918	23·33	13·3

Exports. The effect of the enormous rise in price is illustrated by the values obtained for reduced exports since 1914-15.

TABLE No. 43.—*Quantity and value of raw cotton exported from India from 1913-14 onwards.*

Year.	Quantity.	Value.
	Cwts.	£
1913-14	10,626,312	27,361,655
1914-15	10,849,045	22,325,[illegible]31
1915-16	8,853,967	16,619,247
1916-17	8,912,302	24,067,506
1917-18	7,308,105	28,438,272
1918-19	3,679,091	20,655,709

When the trade is classified according to the port from which shipment is effected, the preponderating share of Bombay is clearly emphasized. Bombay was also less affected by conditions operating to reduce the volume of exports than any other port except Rangoon, which alone recorded increased shipments in 1918-19 when the general total was the lowest recorded for seventeen years.

TABLE No. 44.—*Exports of raw cotton from different ports from 1913-14 onwards.*

Year.	Bombay.	Karachi.	Calcutta.	Rangoon.	Tuticorin.	Madras.
	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.
1913-14 . .	7,609,236	1,493,736	567,423	169,797	393,035	235,821
1914-15 . .	7,763,701	1,445,935	359,595	167,521	306,150	183,690
1915-16 . .	7,151,457	641,626	389,643	104,835	283,200	169,920
1916-17 . .	7,588,580	399,641	260,821	111,117	276,050	165,630
1917-18 . .	6,672,702	38,287	147,791	128,357	160,450	96,270
1918-19 . .	3,266,842	15,570	93,840	191,872	107,524	3,353

The bulk of the shipments before the war went to the Far East and the Continent, and Lancashire has hitherto depended to an insignificant extent upon Indian cotton. According to the Cotton Control Board the estimated consumption of East Indian cotton in the United Kingdom was less than 100,000 bales in 1918 as compared with 528,000 of Egyptian and over 2,000,000 of American cotton. Though cotton growing is reported to be superseding opium cultivation in more than one province of China the war has brought into stronger relief the dependence of Japan upon India for unlimited supplies of this raw material. And in this connection it is of interest to record that the carrying trade of Indian cotton to Japan has been almost completely, at least temporarily, transferred from British to Japanese bottoms.

TABLE No. 45.—*Distribution of the exports of raw cotton among principal importing countries.*

Countries.	1913-14.	1914-15.	1915-16.	1916-17.	1917-18.
	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.
Japan	4,817,560	4,454,931	5,917,663	5,791,289	5,188,570
Germany	1,688,070	1,239,472	...	...	...
Belgium	1,133,083	794,369	...	...	...
Italy	848,576	1,354,902	1,124,106	966,391	553,930
Austria-Hungary	747,041	585,735	...	...	...
France	524,264	552,273	205,457	264,940	160,357
United Kingdom	384,914	707,779	833,628	801,132	1,137,500
Spain	166,933	224,964	239,025	254,677	12,443
Hongkong	109,581	102,164	84,771	50,216	...
China	84,707	146,026	296,664	286,125	88,928
Holland	28,922	17,965	2,030	2,589	..
United States of America.	26,482	30,809	24,384	14,420	31,530
Russia	26,327	54,661	937	27,674	42,611
Other countries	39,852	83,045	115,302	46,543	92,236
TOTAL	10,626,312	10,349,045	8,853,967	8,505,996	7,308,105

The great falling off in exports in 1918-19 which has already been referred to, is ascribed to the unprecedentedly high prices which prevailed during the greater part of the year, and a smaller crop. Of the 3,679,000 cwts. shipped, Japan absorbed 2,797,000 cwts., Italy, 441,000 cwts. and the United Kingdom 276,000 cwts.

Mill consumption.

With these exports must be contrasted the estimated consumption of indigenous cotton by Indian mills, which is arrived at by deducting the quantity of raw cotton imported from the gross figures of mill consumption. No exact estimate of extra-mill or domestic consumption is possible, but 750,000 bales of 400 lbs. each is probably fairly accurate. The quantity of hand-spun cotton is certainly declining as handloom weavers are coming to depend more and more upon yarn from the mills.

TABLE No. 46.—*Net consumption of indigenous cotton by Indian power mills.*

Year ending 30th June.	Approximate quantity consumed.	Less imports of raw cotton.	Net consumption.
	Cwts.	Cwts.	Cwts.
1911	6,670,531	65,347	6,605,184
1912	7,175,357	823,724	6,351,633
1913	7,336,056	208,885	7,127,171
*1914	7,800,961	24,779	7,476,182
*1915	7,359,212	88,225	7,270,987
*1916	7,692,013	21,847	7,670,166
*1917	7,693,574	40,991	7,652,583
*1918	7,209,873	93,829	7,206,044

* Year ending 31st August.

Ginning.

The differences with regard to ginning, baling and pressing are almost as many as the varieties of cotton grown. In the Punjab and Burma, for instance, the ginners buy the seed cotton, elsewhere they mostly gin on commission. In the south of India, however, where the ginners are also exporters, they buy only the lint after ginning. The greater part of the crop is machine ginned, but except in Dharwar where the American saw gin is used, chiefly with roller gins. In many of the more important cotton growing centres the big European cotton exporters have their own gins.

Baling and pressing.

Though the loose bundles of ginned cotton if intended for Indian mills are sometimes only half pressed in old fashioned screw presses, the bulk is steam pressed in steel hooped bales upcountry and so railed down to the port. The density of the pressing varies from 45 to 65 lbs. per cubic foot.

The greater part of the Indian cotton crop is sent to Bombay where it is stored in the open air at the Cotton Green at Colaba, exposed not only to the weather but also to serious risk of fire. Until July 1918, there was no single body controlling dealings in raw cotton and transactions were carried on under the rules of either the Bombay Cotton Trade Association or the Bombay Cotton Exchange, mostly of the former, though adhesion to either set of rules was voluntary. Since July 1918, all cotton transactions in Bombay have been controlled by the Cotton Contracts Board, originally appointed under the Defence of India rules but now formally constituted under Bombay Act I of 1919. The Board consists of an official chairman and six members nominated by Government and five elected, two by the Millowners' Association and three by the members of the Clearing House and contracts not in conformity with the rules promulgated by them are not enforceable at law. Their exchange and arbitration rooms adjoin the Cotton Green which it is under contemplation to remove to a more convenient site at Sewri. The Act from which the Board derives its authority is to remain in force for a maximum period of two years from the signing of peace.

Before the expiry of that period it is hoped that a single, thoroughly representative association will have been formed to take over permanent control of the trade.

Unit of sale and shipment.

The units vary at the different ports. In Bombay the unit of sale is the candy of 784 lbs., in Karachi the maund of 84 lbs., in Calcutta the bazaar maund of $82\frac{2}{15}$ lbs. and in the south the candy of 500 lbs. generally. Quotations for export to the United Kingdom are generally per lb. *c.i.f.* Shipment is made from Bombay in bales of 392 to 500 lbs. and from Karachi in bales of 400 lbs. Calcutta adopts the bale of 392 lbs. while at the Madras ports the weight varies from 400 to 500 lbs.

Freight.

For freight purposes all cotton is taken on measurement, one ton being equal to 40 cubic feet. Ordinarily one hundred bales of 400 lbs. each will measure between 25 and 26 tons. In Tuticorin, however, where *Cambodia* and *Tinnevellies* are usually shipped in bales weighing 500 lbs. the compression is so great that one hundred bales measure only 19 tons approximately, *i.e.*, five bales to the ton.

Kapok.

Kapok or silk-cotton which may be conveniently noticed here is the floss obtained from the seed capsules of the white flowered *eriodendron anfractuosum,** which grows in the hot moist tracts of western and southern India and of Burma. The fibre is too short, light and smooth to be easily spun unless as an admixture with other flosses and its chief use is in upholstery for filling cushions, etc., where it has the advantage, unlike ordinary cotton, of not readily balling. On account of its buoyancy and freedom from water logging it is also in great demand for life belts. The chief sources of supply for the European markets are the Dutch Indies and, to a smaller extent, Ceylon where the tree is widely cultivated for the floss while in India, no systematic planting has yet been attempted and the export was until recently so insignificant that no separate statistical records were kept of it. Even now while the internal trade has developed considerably, the quantity shipped is small and probably the total is swelled by shipments of the floss obtained from the *bombax malabaricum*, the red silk cotton tree, which is of much commoner occurrence in India than the white, but is incorrectly called kapok. In 1914-15 the total was 16,000 cwts. and in the two subsequent years 16,000 and 13,000 cwts. valued at about £25,000, the chief markets being the United Kingdom and Italy. Before the war there were some shipments to Germany, Holland and Belgium also. Exports are confined to Calcutta and Bombay.

The unit of sale in Calcutta is the pound and shipment is made in pressed bales, rope-bound, weighing two maunds nett. In Bombay sales are per candy of 784 lbs. or per maund of 28 lbs. while shipment is effected in pressed bales weighing from 2 to $2\frac{1}{2}$ cwts. Quotations for export to the United Kingdom are per lb. *c.i.f.*

* *Bombax pentandrum. Linn.*

COTTON MANUFACTURES.

Progress of the industry.

Of the cotton produced in India it may be said in general terms that half is exported raw, and one quarter in the form of yarn, while the balance is manufactured into yarn, and cloth in Indian mills. The chief centre of the cotton trade and cotton manufacturing industry is Bombay. Cotton manufactures now represent about 21 per cent of the total value of Indian manufactures exported and about 5 per cent of the total export trade of the country. In 1918 the total number of cotton mills in India was 269 with 6,614,269 spindles and 114,805 looms. The first cotton mill in India was started in 1838 at Goosery near Calcutta and the first to be opened in Bombay dates from 1853 with 5,000 throstle spindles.

In the last twenty years the number of spindles has increased by 50 per cent. and the number of looms is nearly three times as great but the tendency has been to enlarge existing mills rather than open new ones. Indeed India at the outbreak of war ranked as fourth among the countries of the world manufacturing cotton textiles, being exceeded by Great Britain, the United States and Germany only. The table below shows the progress made during the last forty years. Statistics for 1918-19 are not available yet.

TABLE No. 47.—*Progress of the cotton spinning and weaving industry in India since the year 1879-80.*

Year.	Number of mills in existence.	Number of: Persons employed.	Looms.	Spindles.
1879-80	58	39,537	13,307	1,470,830
1888-89	109	92,126	22,156	2,670,022
1898-99	174	156,132	37,288	4,463,342
1908-09	233	236,827	74,592	5,966,530
1909-10	245	232,381	80,171	6,142,551
1910-11	254	230,876	84,627	6,346,675
1911-12	258	236,847	87,640	6,427,181
1912-13	266	258,551	91,585	6,495,012
1913-14	264	260,847	96,688	6,620,576
1914-15	255	260,440	103,311	6,598,108
1915-16	267	292,160	108,417	6,675,688
1916-17	267	277,370	110,812	6,670,162
1917-18	269	284,054	114,805	6,614,269

Of the total number of mills in India 173 are in the Bombay Presidency, 14 in Bengal, 19 in the United Provinces, 13 in Madras, 9 in Central Provinces and Berar, 4 in the Punjab, 4 in French India and the rest in Native States including one at Quilon in Travancore. The mills of the Bombay Presidency (chiefly situated in Bombay City and Ahmedabad) produce about 75 per cent of the yarn spun and 87 per cent of the cloth woven. There are also an unascertainable number

of handlooms all over India working chiefly with yarn supplied from spinning mills though hand spinning has not altogether died out. From a statement compiled by the Industrial Commission it would appear that the mill-made and foreign yarn available for handloom weavers averaged in the quinquennium 1908-09 to 1913-14 over 250 million lbs. annually (after allowance had been made for manufactures of rope and twine) against an estimated intra-mill consumption of 222 million lbs.(a)

TABLE No. 48.—*Quantity in lbs. of mill-made and foreign yarn available for handloom weavers.*

Particulars.		Average of 1896-97—1901-02.	Average of 1908-09—1913-14.
		Lbs.	Lbs.
1. Yarn imported	by sea	44,955,812	41,748,910
	by land	1,008	79,744
2. Yarn made in Indian mills		473,000,044	648,559,400
	TOTAL	517,956,864	690,388,054
3. Yarn * exported	by sea	209,397,927	200,831,400
	by land	7,610,064	14,631,904
	TOTAL	217,007,991	215,463,304
4. Nett quantity available in India		300,948,873	474,924,750
5. † Cloth made in Indian mills		98,728,909	248,917,909
6. ‡ Equal to yarn		88,150,812	222,248,133
7. Yarn (mill-made) available for hand-loom weavers (col. 4—col. 6).		212,798,061	252,676,617

* Including re-export.
† All woven goods.
‡ Calculated at the rate of 100 lbs. yarn=112 lbs. cloth.

Production of yarn.

The sea-borne trade statistics do not support the allegation sometimes advanced that India exports raw cotton and repurchases it as yarn, for Japan, the country which predominates in the former market (45 per cent.) is responsible for less than 2 per cent. of the total imports of yarn. The yarn produced in the cotton mills in the last eleven years is shown in the next table.

(a) Report of the Indian Industrial Commission—Appendix I, p 8

TABLE No. 49.—*Abstract statement of the quantity (in pounds) of yarn produced in the cotton mills in India during the last eleven years.*

Year.	Bombay.	Madras.	Bengal.	United Provinces, also Ajmer-Merwara.	Punjab (including Delhi).	Central Provinces and Berar.	Native States and foreign territory.	GRAND TOTAL.
1908-09 . .	469,194,256	39,635,423	39,146,723	38,870,997	13,265,405	29,773,277	27,699,078	657,585,159
1909-10 . .	437,484,282	40,595,990	34,419,392	39,801,222	10,936,800	30,186,255	34,157,621	627,581,562
1910-11 . .	424,902,640	41,070,719	38,278,828	36,205,427	8,224,423	28,314.423	32,930,681	609,927,141
1911-12 . .	441,521,380	42,838,086	32,625,497	39,487,426	6,630,835	27,738,443	34,188,532	625,030,199
1912-13 . .	485,566,927	44,974,138	37,355,133	43,765,289	5,321,927	33,581,772	57,890,324	688,455,490
1913-14 . .	479,682,975	44,673,626	33,219,947	44,468.505	6,274,754	36,532.870	37,924,174	682,776,851
1914-15 . .	448,556,493	43,031,691	31,708,798	50,281,135	6,813,549	34,505,150	37,027,841	651,984,657
1915-16 . .	509,770,810	44,303,310	32,096,459	51,999,121	7,541,825	37,443,174	39,269,880	722,424,579
1916-17 . .	482,147,956	44,187,107	28,568,029	48,753,354	6,452,738	34,337,717	36,660,330	681,107,231
1917-18 . .	468,972,125	43,092,929	32,881,683	41,290,033	7,097,424	33,466,316	33,775,105	660,575,615
1918-19 . .	427,638,345	42,787,344	32,507,148	36,447,155	6,900,776	34,279,946	34,479,750	615,040,464

In the early days of the industry the manufacturers of cotton textiles were concerned chiefly with the production of lower counts of yarn for shipment to China and for use on indigenous handlooms, but the tendency in recent years has been to spin higher counts of yarn, supplementing Indian supplies with imported long staple cotton. The great difference between the Lancashire and Eastern cotton spinning industries may be illustrated by the following. Of the world's spindles 39 per cent are in the United Kingdom, but they consume only 16 per cent by weight of the world's cotton crop, while India and Japan with one-sixteenth of the total spindles employ one-fifth of the world's crop.

Imports of yarn.

It is interesting to compare the imports of coarse, medium and fine yarns with the production of similar descriptions by Indian mills.

TABLE NO. 50.—*Imports and production of cotton yarn in 1913-14 and 1918-19 contrasted.*

Yarn.	1913-14.			1918-19.		
	Quantity in lbs.	Percentage of class.	Percentage of total.	Quantity in lbs.	Percentage of class.	Percentage of total.
Nos. 1 to 25—						
Indian . .	616,688,000	99·65	84·83	538,295,000	98·45	82·41
Imported . .	2,150,000	·35	..	8,450,000	1·55	..
Nos. 26 to 40—						
Indian . .	62,711,000	69·64	8·62	71,950,000	79·24	11·01
Imported . .	*27,344,000*	*30·36*	..	*18,849,000*	*20·76*	..
Nos. above 40—						
Indian . .	3,377,000	30·05	·46	4,786,000	41·54	·73
Imported . .	7,859,000	69·95		6,734,000	58·45	..
TOTAL .	726,948,000*	..	100	653,136,000*	..	100

* Includes imports of mercerised and unspecified descriptions of twist and yarn.

While the war lasted Indian mills have been spinning less and less of the lower counts. Of counts 1 to 10 the total was 87 million pounds in 1918-19 as compared with 130¾ million in 1913-14 and the drop in counts 11 to 20 was about 47 million pounds. On the other hand in counts above 20 there was a considerable rise particularly in counts above 40 which may be due partly to the demands of the handloom weavers of finer products which importers were for a variety of reasons unable to satisfy. There is a prospect of India before long being able to command considerable quantities of long staple cotton from Uganda, but even if this materialises, it is regarded as doubtful in well informed quarters whether the tendency to spin more yarn of higher counts will be maintained after the war, particularly if there is any further appreciation in the gold value of the rupee. In 1912 and 1913 there had been a marked decline in the spinning of counts between 31 and 40 in Indian mills.

In the next table will be found the estimated production of woven goods in all the power mills in India during the last four years. No exact estimate of the production of the handlooms scattered over the country can be attempted but it is probably in the neighbourhood of 250,000,000 lbs.*

Production of woven goods.

TABLE NO. 51.—*Abstract statement of the quantity (in lbs.) of woven goods produced in the cotton mills in India during the last four years.*

Manufactures.	1915-16.	1916-17.	1917-18.	1918-19.
	Quantity.	Quantity.	Quantity.	Quantity.
	Lbs.	Lbs.	Lbs.	Lbs.
Grey and bleached piecegoods	267,165,288	274,851,443	268,772,199	257,839,998
Coloured piecegoods . .	81,603,755	98,351,965	106,751,853	176,711,011
Grey and coloured goods other than piecegoods	2,540,552	3,113,286	3,639,423	3,743,704
Hosiery	356,077	409,790	349,373	260,968
Miscellaneous . . .	588,883	959,679	1,638,317	1,826,837
Cotton goods mixed with silk or wool.	...	†42,653	253,004	307,165
TOTAL .	352,254,555	377,728,816	381,404,169	349,580,450

The production of grey and bleached goods thus represents about two thirds of the whole though the proportion of coloured goods is on the increase.

TABLE NO. 52.—*Quantity and value of exports of cotton manufactures.*

Year.	Yarn.		Piecegoods.	
	Quantity.	Value.	Quantity.	Value.
	(Unit of 1,000 lbs.)	£	(Unit of 1,000 yards.)	£
1909-10	227,364	6,472,726	94,137	1,364,037
1910-11	183,425	5,749,369	99,788	1,409,255
1911-12	151,488	5,060,097	81,429	1,311,084
1912-13	203,961	6,611,230	86,512	1,399,070
1913-14	197,978	6,554,873	89,233	1,424,583
1914-15	133,619	4,190,987	67,194	1,058,489
1915-16	160,231	4,615,244	113,465	1,644,624
1916-17	168,980	5,299,393	263,845	3,650,823
1917-18	121,798	5,043,141	189,450	3,692,162
1918-19	63,798	4,815,549	149,071	4,301,287

* Calculated according to the formula approved by the Bombay Mill Owners' Association that 100 lbs. of yarn yield 112 lbs. of cloth.

† Separately recorded only from 1917.

Exports of yarn.

The exports of yarn were, while normal conditions prevailed, four or five times as valuable as the exports of piece-goods, but these latter have greatly increased since 1916-17. In pre-war times the chief participants were China, (chiefly through Hongkong), Asiatic Turkey, the Straits and Aden.

The exports of yarn to foreign destinations in 1918-19 are shewn in the next statement according to the port of shipment. Bombay has always enjoyed a preponderating share of the trade.

TABLE No. 53.—*Quantity of cotton yarn and twist exported in 1918-19 and the share of the principal ports.*

Port.	Quantity.	Percentage.
	Lbs.	
Bombay	62,562,331	98·0
Calcutta	755,762	1·1
Tuticorin	241,900	·3
TOTAL .	63,797,909	100

The total volume of exports in 1918-19 fell by nearly 50 per cent. owing to high rates prevailing for raw cotton in India, which so enhanced the price of yarn as to encourage unprecedented arrivals of Japanese and Chinese yarns at Bombay. Since the close of the year, however, the temporary boycott of all Japanese goods in China has revived the demand for Indian yarn in that country.

Exports of cotton manufactures.

The exports of cotton manufactures other than yarn bear a very small proportion to the total output of the mills. The exports of cotton manufactures, classified according to descriptions, have been as follows since 1913-14.

TABLE No. 54.—*Values of the exports of cotton manufactures (other than yarn and twist) since 1913-14 classified according to descriptions.*

Descriptions of cotton manufactures.	1913-14.	1914-15.	1915-16.	1916-17.	1917-18.	1918-19.
	£	£	£	£	£	£
Piecegoods, grey.	473,892	345,317	508,249	1,699,749	1,159,404	1,224,344
„ white	11,912	5,347	7,366	31,831	55,991	96,080
„ coloured, printed and dyed . .	938,779	707,831	1,129,009	1,919,243	2,476,767	2,980,863
Handkerchiefs and shawls .	54,385	57,226	97,789	47,676	26,716	19,994
Sewing thread .	11,870	5,083	11,285	18,399	9,125	14,027
Hosiery . .	9,698	5,560	9,435	12,036	10,037	50,599
Other sorts .	24,563	23,041	25,596	66,760	103,124	158,759
TOTAL .	1,525,099	1,149,365	1,788,729	3,795,694	3,843,495	4,544,666

The chief markets for cotton cloth woven in India are those colonies and countries in which there is a considerable Indian immigration. Bombay is the principal port of shipment for *chadars* and *dhootis, T cloths** and *domestics*, the principal destinations being Aden, East Africa (including 'German' and Portuguese East Africa), Persia, Zanzibar, the Straits and Baluchistan (*viâ* Karachi), while coloured *lungis* and *saris* which go chiefly from Madras are shipped to the Straits Settlements, Ceylon and Sumatra.

As an example of handloom weaving for export, the trade in Madras handkerchiefs may be cited, which are shipped to the United Kingdom, though their ultimate destination is chiefly Africa. These so-called 'handkerchiefs' are made with 40*s* to 60*s* in pieces 8 yards by 3.

Of the ports participating in the export trade, 51 per cent. went from Bombay, and 46 per cent. from Madras, calculated upon the totals for the last pre-war year, but in the special conditions governing freight while war lasted, Bombay has captured a much larger share of the trade.

Cotton carpets.

Two main varieties of cotton carpets may be distinguished as made in India, one resembling the woollen pile carpet but with warp, weft and pile all of cotton yarn, and the commoner kind without any pile and with the same design on both sides. The latter are produced in three principal forms—*daris* (bed carpets), *shatranjis* (floor carpets) and *jainamaz*† (prayer mats). This distinction of terms is not however strictly observed and all pileless cotton carpets are commonly designated *daris*. In the *dari* proper, the pattern generally consits of stripes of various colours, blue and white being the favourite combination, but flowers and geometrical shapes are not infrequently woven into the body of the fabric. The looms on which *daris* are woven are generally horizontal and the dyes formerly in use were indigenous vegetable dyes principally indigo, but the cheapness of aniline dyes has led to the increasing adoption of the latter. The weavers in most of the provinces are poor Mahomedan or low caste Hindus and the organisation of the trade largely depends on a system of advances by *mahajans* or middlemen who sell the outturn at the big trade centres. *Daris* properly so called are generally purchased in the piece, while floor carpets are sold by the yard or by weight.

The chief centres of manufacture are Bareilly, Aligarh, Agra, Cawnpore, Farukhabad, Moradabad and Etawah in the United Provinces. The *daris* of Agra are noted for their finish, those of Bareilly for their cheapness and durability and of Aligarh for the closeness of the stitch. The industry is expanding in Cawnpore where large mills under European and Indian management are manufacturing with machinery larger sizes suitable for tents and bungalows and turning out considerable quantities for export to England and America. Other provinces where cotton carpets are made are the Punjab, chiefly in the districts of

* A grey calico, so-called from an old trade mark
† In the Central Provinces, *ja-namaz.*

Multan, Amballa and Hoshiarpur, the Delhi Province, the Bahawalpur State, Patna city, and the Champaran and Shahabad districts of Bihar and Ayyampet, Bhavani, Adoni and Kurnool in the Madras Presidency where the local name for these carpets is *jamkalam*. In the Bombay Presidency a not inconsiderable industry is carried on in some of the Deccan districts. It is also a popular jail industry in nearly every province.

No separate statistics are maintained of the exports.

GRAIN, PULSE AND FLOUR.

Rice.

Production.

Although in favourable seasons, barley, millets and pulses are exported in considerable quantities from India, the most valuable exports included under the head 'Grains and Pulses' have invariably been rice and wheat, their aggregate values representing about 90 per cent. of the whole. The world production of cleaned rice has been calculated* as in the neighbourhood of 60,000,000 tons exclusive of an entirely empirical estimate of 30,000,000 tons for China. India's share of this grand total of 90,000,000 tons may be taken approximately at 40 per cent., and though her average exports seldom exceed 7 per cent. of her total estimated production, she is nevertheless the largest exporter of rice in the world. India's export trade in rice is less susceptible to seasonal influences than in the case of the majority of food grains because in Burma which contributes the greater part of it, a failure of the rains is unknown. The volume of export to foreign countries is however affected by crop shortage in other parts of India.

TABLE No. 55.—*Exports of rice according to provinces from 1909-10 in round figures.*

Year.	Provinces.				Total.	
	Burma.	Bengal.	Madras.	Bombay and Sind.	Quantity.	Value.
	Tons.	Tons.	Tons.	Tons.	Tons.	£
Pre-war years—						
Annual average for quinquennium—1909-10 to 1913-14 .	1,814,000	374,000	121,000	60,000	2,398,000	15,107,000
1913-14	1,835,000	327,000	155,000	82,000	2,420,000	17,599,000
War years—						
1914-15	1,115,000	170,000	183,000	66,000	1,538,000	11,339,000
1915-16	945,000	75,000	239,000	80,000	1,340,000	10,192,000
1916-17	1,186,000	64,000	184,000	154,000	1,585,000	12,326,000
1917-18	1,499,000	71,000	173,000	196,000	1,939,000	13,774,000
1918-19	1,611,000	153,000	96,000	157,000	2,018,000	15,310,000

* Bulletin of the Imperial Institute, Vol. XV, April—June 1917, page 254.

Any failure of the monsoon in India at once creates a remarkable inflation of values in Burma to which the range of prices in foreign markets does not usually respond. Prior to 1910-11 the average exports of rice from India did not exceed two million tons; but the trade subsequently expanded and in 1912-13 the total exports amounted to 2¾ million tons. The aggregate for 1913-14 was a little less than 2½ millions.

Effects of war upon exports.

The effect of the war upon this trade was very marked as the above table illustrates. The principal causes of the shrinkage in exports from Burma and Bengal in the first three war-years were the loss of enemy markets and shortage of shipping. In the last three months of the official year 1917-18, the Home Government's requirements of rice and the allocation to Rangoon of a considerable amount of tonnage enabled over one-and-a-half million tons to go forward. In normal years the market for Indian rice in Ceylon is pretty constant, aggregating about 300,000 tons annually. A satisfactory feature of the statistics of exports to Europe is however the increasing volume of exports direct to the United Kingdom.

TABLE NO. 56.—*Direct exports of rice to the United Kingdom during the last six years.*

——	1913-14.	1914-15.	1915-16.	1916-17.	1917-18.	1918-19.
Tons	161,409	211,794	297,142	321,452	523,174	252,010

Before the war a good deal of Indian rice was cleaned and polished in Germany and Holland before it reached the United Kingdom. The pre-war freight rate to the United Kingdom from Rangoon for rice was in the neighbourhood of 25 shillings per ton: at the time of the declaration of the armistice the Government rate was 125 shillings and for outside steamers 400 shillings and upwards.

Principal recipients.

Of India's total exports about 47 per cent. went in pre-war days to Europe, 42 per cent. to other Asiatic countries (Ceylon, the Straits Settlements, Japan, etc.), the remaining 11 per cent. being distributed amongst Africa, the West Indies and South America. About half the volume of exports is for consumption as food, the remainder being utilized partly for food and partly for the manufacture of spirits and starch. Germany was India's chief individual customer, accounting, with Austria-Hungary, on the average for the five years ending 1913-14 for 22 per cent. of the whole. Holland took 10 per cent., Ceylon 13½ per cent. and the Straits Settlements 13 per cent. Japan and Java were also at various times considerable customers. Direct trade with the West Indies has developed considerably during the war. The demands of Cuba were previously met by re-exports of Rangoon rice, practically all *Straits quality*, from Liverpool or by German millers with similar or better qualities produced

from cargo rice purchased in Burma. Direct shipments, chiefly from Calcutta, only in one year exceeded 2,500 tons. The exports from Burma to Cuba in 1915-16 amounted to 28,071 tons and in 1916-17 to 75,451 tons, the corresponding figures for Calcutta being 7,176 tons and 10,199 tons respectively. If more freight had been available the Calcutta figures in this and the following year would have been largely increased. In 1918-19, the strict rationing established just before the new Burma crop came on the market disappointed many prospective buyers. The Bengal rice which goes to Cuba is of a quality grown chiefly in the districts adjoining Calcutta for which there is little or no demand in India.

Burma practically has a monopoly of the export trade in rice and also makes good any shortage in the supply for local consumption in other parts of India, because the ratio of acreage under rice to population is so high that her exportable surplus is far larger than that of Bengal, Bihar or Madras who grow more rice but have to meet a much higher internal demand. The Burma trade represents between 70 and 75 per cent. of the whole. The Madras trade is practically confined to Ceylon and Mauritius.

Acreage.

The acreage and production of cleaned rice in British India in the last six years according to the forecasts issued by the Department of Statistics are as indicated in the following table.

Table No. 57.—*Acreage and production of cleaned rice in British India from 1913-14.*

Year.	Area.	Production.	Exports (rice not in the husk).	Percentage of 4 to 3.
1	2	3	4	5
	Acres.	Tons.	Tons.	
1913-14	76,908,000	30,138,000	2,419,850	8
1914-15	77,669,000	28,244,000	1,538,300	5½
1915-16	78,679,000	33,206,000	1,339,800	3
1916-17	81,020,000	35,442,000	1,584,750	4½
1917-18	80,668,000	36,594,000	1,910,884	5
1918-19	76,734,000	24,095,000	2,017,916	8

In addition there is an estimated production in the Native States which is roughly placed at 1,000,000 tons. The yield per acre for British India is about 8½ cwts., which compares very unfavourably with Japan

and Egypt where it is between 21 and 22. The area in the principal provinces in 1917-18 and their percentage are shewn below.

TABLE NO. 58.—*Acreage under rice according to provinces in 1917-18.*

Provinces.	Acres.	Percentage.
Bengal	20,962,000	26
Bihar and Orissa	15,646,000	19½
Madras	11,655,000	14½
Burma	10,803,000	13
United Provinces	7,417,000	9
Central Provinces and Berar	5,271,000	6½
Assam	4,802,000	6
Bombay (including Sind)	3,081,000	4
Punjab	1,005,000	1
TOTAL	80,668,000	100

Terms employed.

Rice in the husk before hulling is known as *paddy*. After hulling it becomes *rough rice* and after pearling it becomes *cleaned or white rice*. The broken grains of rice are separated out and sold as *coodie* or *khood*, while the higher grades of rice are subject to a further process of polishing on sheepskins with the object of removing any rice meal which may adhere to the grain. No chemicals whatever are used in this polishing process or in any other process connected with the milling of rice. *Cargo rice* contains 5 to 20 per cent. of unhusked rice, *i.e.*, paddy, and, if exported in this form to Europe, is subject to further milling on arrival there. The ratio of paddy to rice by weight depends entirely on the quality of rice produced. In the case of *specials* it may be taken as of 8 : 5, but the ratio for better qualities is lower.

For *boiled rice* there is no market in Europe, but there is a considerable demand for the grain in this form in India and also in countries where Indian labour is employed such as the Federated Malay States and Ceylon. The process may be roughly described as follows. The paddy is soaked in water, for from forty to eighty hours according to grain and season and boiled for twenty to forty minutes and dried before husking. This business is largely in the hands of small millers in out of the way places where there is plenty of room to spread the rice after steaming to dry in the sun though artificial drying is not unknown. This parboiled rice has a higher nutrient value, owing to its lighter milling and though when husked it has a yellow tinge it becomes white when cooked and keeps better afterwards, which is a great asset when rice is prepared overnight to be eaten the following day. Attempts are being made in Rangoon to evolve a more scientific process for the production of parboiled rice but it cannot be said that any entirely satisfactory plant has yet been elaborated.

Rice meal.

In the official Indian trade returns rice meal is merged in the general heading 'Bran and Pollards.' The total quantity exported under this item in 1914-15 was

194,588 tons of which 183,697 tons were shipped from Burma and the Burma exports are known to consist entirely of rice meal. The United Kingdom was formerly the principal customer for Burma rice meal as cattle fodder, taking about 120,000 tons each year and before the war the Straits Settlements and Germany came next in importance taking about 30,000 to 40,000 tons each. In 1917-18 the exports declined from 143,888 tons valued at £247,000 to 22,115 tons valued at £18,800. Shipments to the United Kingdom which exceeded 100,000 tons in 1916-17 fell to 3,380 tons and the average *f.o.b.* price was Rs. 13 (17*s.* 4*d.*) per ton as against Rs. 26 (£1-14-8) in the previous year. At the end of 1917-18 there were probably not less than 100,000 tons accumulated at the mills and available for export had freight been forthcoming. In 1918-19 there was little improvement in the market, but with prices falling to the neighbourhood of Rs. 8 (10*s.*-8*d.*) per ton, about 30,000 tons were taken by the Straits Settlements and rather less than 10,000 tons by the United Kingdom.

Export duty. An export duty of three annas per maund (equivalent to about 1½*d.* a bushel) is levied on all foreign exports of rice husked or unhusked including rice flour but not meal the tax being included in the *f. o. b.* price. The total revenue from this source during the last six years is shewn below.

TABLE NO. 59.—*Revenue derived from export duty on rice since 1913-14.*

Year.	Revenue.
	£
1913-14	860,000
1914-15	553,000
1915-16	507,000
1916-17	580,000
1917-18	702,000
1918-19	741,000

Exports. For statistical purposes, foreign and coastwise exports of rice are divided up into two heads—rice in the husk (paddy) and rice not in the husk (rice), but the volume of the former seldom exceeds 50,000 tons in the year, the chief destination being Ceylon. Rice not in the husk includes boiled rice. The principal countries participating in the export trade in rice before the war and in the last year of the war are shown in the table sub-joined.

The exports to Java vary according to the quantities which that country is able to obtain from Indo-China and Siam and the prices ruling in those markets. In 1910-11 and 1911-12 they exceeded a quarter of a million tons and in 1912-13, 160,000. While India exported about 1,400,000 tons to foreign countries in the last pre-war year, Siam and Indo-China, the next most important exporting countries, supplied an almost equivalent quantity to British countries (1,300,000 tons). Japan has not succeeded in becoming self-supporting in the matter of foodstuffs as at one time she seemed likely to be. The distribution in 1918-19 was largely affected by the operations of the Royal wheat Commission.

TABLE NO. 60.—*Quantities and values of rice exported from India in 1913-14 and 1918-19 classified according to destinations.*

Destinations.	1913-14.			1918-19.		
	Tons.	Per cent.	£	Tons.	Per cent.	£
Ceylon	335,059	13·8	3,162,450	340,959	16·9	3,118,860
Straits Settlements, including Labuan.	284,589	11·8	1,915,029	337,799	16·7	2,091,280
United Kingdom . . .	161,409	6·7	1,129,677	270,143	13·4	1,669,594
Egypt	53,884	2·2	371,097	5,966	·3	553,572
Mauritius and Dependencies .	51,344	2·1	503,988	42,249	2·0	360,218
Other British Possessions .	144,878	6·0	1,189,541	107,545	5·4	1,311,688
TOTAL BRITISH COUNTRIES .	1,031,163	42·6	8,271,782	1,104,661	54·7	8,495,592
Holland	333,732	13·8	2,026,221	..	..	..
Germany	315,895	13·1	2,096,054	..	..	..
Austria-Hungary . . .	211,442	8·7	1,370,032	..	..	..
Japan	160,646	6·6	1,076,886	205,372	10·1	1,270,234
Asiatic Turkey . . .	81,057	3·4	665,869	44,905	2·2	626,805
Java	39,412	1·6	261,158	83,760	4·1	526,193
France	23,679	0·9	152,972	113,349	5·6	735,002
Italy	901	·04	6,110	129,606	6·4	826,994
Other Foreign Countries .	221,998	9·26	1,672,498	336,263	16·9	2,829,203
TOTAL FOREIGN COUNTRIES .	1,388,700	57·4	9,327,800	913,255	45·3	6,814,431
ALL COUNTRIES .	2,419,863	100·0	17,599,582	2,017,916	100·0	15,310,023

Burma.

Since the British occupation in 1852, rice has been Burma's principal export and Rangoon rice, as it is called, is the standard of the European rice trade. About two-thirds of the rice crop comes from Lower Burma where it represents 90 per cent., of the cultivated area. From threshing floor to river or railhead the paddy is commonly carted in bulk. It is thence conveyed to the various ports either by rail in bags or more commonly by boat in bulk, measured alongside the mills as discharged, and stored in the mills' *godowns*. Paddy prices in Rangoon are quoted with reference to a unit of 100 baskets containing 46 lbs. each, but in the districts the baskets used are not standardised and there is considerable local variance. For example the Akyab paddy basket contains 23 lbs only.

Marketing.

As a rule the paddy is taken over from the cultivator on the threshing floor either by middlemen acting on behalf of the mills, by speculators, or by local traders known as jungle brokers. The beginning of the paddy season corresponds pretty closely to that of the calendar year as harvesting commences generally towards the end of November and the crop comes commercially into sight in January. The crop is all hand-reaped chiefly by *coolies* from Madras and Bengal, mechanical aids being unknown. The mills which own their own boats advance money to their paddy buyers on the security of the latter's land or other

property. In some cases the paddy buyers mortgage their boats against the moneys received. A boat may do three or four trips per month according to the position of the paddy, but if bringing paddy from the more distant and outlying districts a full month may be occupied in making one trip. As soon as the buyer obtains a boat he proceeds to the district, buys grain and brings it to the mill for measurement. Measurement is done fairly rapidly and in very few cases occupies more than one day. In fact, generally speaking, the boats which arrive in the morning can return upcountry the same day. When a boat of paddy is discharged, a certain number of baskets is weighed and the average weight arrived at therefrom is taken as representing the weight of the whole consignment, credit being given to the seller for any excess over 46 lbs. and deductions being made if the average weight is found to be less than 46 lbs. Storing facilities in the districts which were formerly limited are now considerable and at a rough estimate almost half the exportable surplus can be distributed in *godowns* upcountry. Paddy deteriorates to some extent as regards colour and grain with lengthy storage, but its merits as a foodstuff remain unimpaired. Deterioration in colour is brought about by heating and so far no expedient has been hit upon to overcome this difficulty.

Milling.

In the cargo rice mill, the paddy is put over shakers and sieves in order to remove extraneous matter, such as stones, dirt and straw, and winnowed. It is then hulled, *i.e.*, passed between the grind stones which remove the husk, winnowed again and then becomes what is known as *loonzain*. 'Five parts cargo rice' consists of 80 per cent. loonzain and 20 per cent. paddy. In white rice mills, the loonzain rice is again milled by cones or pearlers, which remove the outer cuticle. The rice then goes through a further process of sieving, the sieves being so arranged and graded that the percentage of broken rice which it is desired to separate from the whole rice can be removed and bagged off separately. It is then re-winnowed and bagged. In the higher qualities of rice usually shipped to Europe, there is a further polishing in cylinders made of wood and wire gauze in which revolve rollers covered with sheep skin. This takes place after the rice has left the cones or pearlers, but before the final sieving process. Formerly the bulk of the rice shipped was cargo rice, but now the proportion of white rice to cargo rice shipped is practically the inverse of what it was a quarter of a century ago.

Unit of sale and shipment.

The following are the terms on which rice is sold in Burma :—

When sold	locally,	at a	price	per	100 baskets of 75 lbs. each.
,,	,,	to Europe	,,	,,	,,	cwt. of 112 lbs. nett.
,,	,,	to Java	,,	,,	,,	picul of 136 lbs. nett.
,,	,,	to Manila	,,	,,	,,	picul of 133⅓ lbs. nett.
,,	,,	to Straits	,,	,,	,,	covan of 5,333⅓ lbs. nett.
,,	,,	to Japan	,,	,,	,,	picul of 136 lbs. nett. (or per cwt. of 112 lbs. nett.).
,,	,,	to India	,,	,,	,,	bag (according to weight).

Rice for the United Kingdom is usually on consignment sale through brokers in London. The general level of prices for Burma rice is lower than for any other variety.

The qualities of white rice milled in Burma are known as follows :—

Nos. 1, 2 and 3 Europe rice.
S. Q. (Straits Quality) Europe rice.
Small Mills special.
Big Mills special.

Special grains have their own names, *e.g.*, *Meedong* rice, *Yahine* rice, etc.

The following qualities of broken rice or *coodie* are produced from the above :—

From all qualities :—

Nos. 4, 5 and 6 white broken rice.
Cargo broken rice.

From Nos. 1 and 2 Europe rice :—

A 1, A 2 and A 3 white broken rice.

From No. 3 Europe rice and S. Q. Europe rice :—

B 1, B 2 and B 3 white broken rice.

From Small Mills specials and Big Mills specials and Meedong specials :—

C 1, C 2 and C 3 white broken rice.

The unit of shipment in Rangoon is the bag which varies in weight from 168 to 225 lbs. nett.

The usual busy season for paddy commences about the 15th of January and lasts till somewhere about the 15th of April. By the latter date it is normally reckoned that about half the exportable surplus has been marketed. The remainder of the crop is marketed throughout the year and under normal conditions is delivered at the port of export by the middle of December. There has been a growing tendency of recent years, which war exigencies have accentuated, to store so as to distribute the business more evenly throughout the year. Co-operative Credit Societies have enabled cultivators to hold up part of the harvest instead of rushing it down in the first three months of the season and glutting the market with disastrous results to themselves.

Mills.

The milling capacity of a typical Rangoon mill may be put at about 30,000 baskets of 46 lbs. paddy per day of 12 hours. The largest mill at Pazundaung is capable of turning out 700 tons of cargo rice a day. Mills generally run night and day for about three months in the year and paddy husk is the only fuel used. The quantity of husk produced is always in excess of fuel required and until a year or two ago the surplus husk used to be discharged into the creeks and rivers. Now-a-days, however, when fuel is expensive many other industries are glad to purchase the available surplus.

No exact figures are available as to the number of rice mills in Burma and their milling capacity, but there are over 300 employing twenty

hands or more and on a conservative estimate the outturn may be put at about *6,000,000* tons of *'five parts cargo rice'* per *annum.* In Burma, as in other parts of India, the capacity of mills is considerably in excess of the quantity of grain available for milling.

Prices.

On the outbreak of war the price of paddy was Rs. 130 per 100 baskets of 46 lbs. and of white rice Rs. 315 per 100 baskets of 75 lbs. each. By March 1915 prices had fallen to Rs. 93—95 for paddy and Rs. 230 for rice. Speculation drove the figures up to Rs. 210 and 480 in September but at the end of November white rice was down to Rs. 320. In March 1917 the range of prices was between Rs. 116—120 and Rs. 291—292-8 respectively. Thereafter the price of paddy and of rice declined until Rs. 80 and Rs. 195 respectively were touched in September, a lower level than for many years. In the middle of January a Rice Commissioner was appointed in Rangoon to buy rice on behalf of the Royal Commission on Wheat Supplies. This had the immediate if temporary effect of stiffening the paddy market, but owing to lack of tonnage and sufficient supplies in the hands of millers to meet their commitments the market again receded. As however tonnage came in sight to lift the large quantities demanded by outside markets, particularly Java and Japan, the paddy prices stiffened and by the end of the year reached the high figure of Rs. 160 per 100 baskets of 46 lbs.

TABLE No. 61.—*The distribution of the exports of rice from Burma according to countries in 1913-14 and 1917-18 contrasted.*

1913-14.			1917-18.		
Destination.	Tons.	Per cent.	Destination.	Tons.	Per cent.
British Possessions— .	589,870	32	British Possessions— .	1,048,145	69
Straits Settlements .	280,922	15	United Kingdom .	522,815	35
Other British Possessions.	308,948	17	Straits Settlements	288,552	19
Holland . . .	325,300	18	Ceylon . . .	164,589	11
Germany . . .	297,560	16	Other British Possessions.	72,189	4
Austria-Hungary .	209,470	11	Italy . . .	107,885	7

Other destinations to which increased quantities of rice proceeded in 1917-18 were France, Greece, Mauritius, Japan and Australia, but exports to Holland, Cuba and the Dutch East Indies were greatly in defect. In 1918-19 no private shipments to Europe were permitted and the Allies received the bulk of the purchases made on behalf of the Royal Commission on wheat supplies. Of 1,611,000 tons exported, the United Kingdom absorbed 261,167 tons, France 131,933 tons and Italy 129,601 tons while 50,500 tons were shipped to Egypt 'for orders.' The normal distribution of the foreign trade between the different Burma ports was—Rangoon 68 per cent., Bassein 13 per cent., Moulmein 10 per cent. and Akyab 9 per cent.

Bengal.

Though the average acreage under rice in Bengal and the adjoining province of Bihar and Orissa which is chiefly served by the port of Calcutta* amounts to 47 per cent. of the aggregate for British India, the volume of foreign exports has never been comparable with that of Burma, though in a favourable season the Madras figures are generally exceeded. The principal destinations for Bengal rice in pre-war years were Ceylon and Mauritius. Since 1913-14 Natal has taken an increasing share of the trade and a direct trade with Cuba has sprung up. Of the total, 99 per cent. went in pre-war days from Calcutta and the balance from Chittagong. The following table gives the consolidated Bengal figures.

TABLE No. 62.—*Quantities and values of rice exported from Bengal.*

Year.	Quantity.	Value.
	Tons.	£
1913-14	326,921	3,304,148
1914-15	170,244	1,770,276
1915-16	75,450	841,759
1916-17	64,107	742,600
1917-18	71,404	713,342
1918-19	153,326	1,626.675

Shipments in 1915-16, 1916-17 and 1917-18 were affected by freight shortage, and in 1918-19 when a better shipping position and a brisk demand for common rice from Ceylon, South Africa, Mauritius and the West Indies encouraged heavier exports, it became necessary to conserve supplies for local consumption in consequence of the partial failure of the monsoon. The Foodstuffs Commissioner whose appointment became necessary in October 1918 decided that these markets should be rationed as far as possible from Burma.

The chief varieties of Bengal rice on the market are *table or white Patna, broken table rice* or *khood. Patna, old hard* and *chinisukur*, while among boiled or brown rices may be mentioned *boiled Patna, doud khani, ballam* and *raree.* The principal variety of rice exported is *kazla* which goes to Ceylon. The chief market for white *Patna* before the war was Hamburg. but considerable quantities went also to Liverpool and Bremen ; for *old hard* which is grown chiefly in the neighbourhood of Calcutta (the designation *Patna* having reference to the boldness of the grain and not implying locality of origin), Cuban ports ; and for *boiled Patna* and *ballam* Trinidad, Martinique and the Persian Gulf. For *raree* there is a considerable demand in Mauritius.

The unit of sale in Calcutta is the bazaar maund and shipment is made in bags of 164 or 224 lbs. nett, while sterling quotations are based on the cwt. *c. i. f.*

Madras.

Foreign exports from the Madras Presidency are comparatively limited. The following table shows the quantities exported during the last six years.

* In 1913-14 and earlier years there were also some shipments from Cuttack.

TABLE NO. 63.—*Quantities and values of rice exported from all ports in the Madras Presidency during the last six years.*

Year.	Quantity.	Value.
	Tons.	£
1913-14	155,000	1,570,000
1914-15	183,000	1,850,000
1915-16	239,000	2,627,000
1916-17	184,000	2,077,000
1917-18	173,000	1,965,000
1918-19	97,000	1,126,000

The principal destinations are Ceylon (90 per cent.) and Mauritius (8 per cent.). The chief ports of export were Cocanada, Tuticorin and Negapatam, but the conveniences of the Dhanushkodi route have latterly diverted practically the whole of the Ceylon trade to that port. At Cocanada the usual grades shipped, all parboiled, are *mill rice A, B and C grades, chalyam* or unpolished rice and *bazaar boiled* which is prepared in local hand mills and is of very inferior quality.

The unit of sale and of shipment is the bag of 164 lbs. nett, generally.

Bombay Presidency.
(1) Bombay.

Foreign exports of rice from Bombay are on an even smaller scale than those of Madras. In pre-war years, the average shipments did not exceed 26,000 tons a year, the actual figures for 1913-14 being 28,884 tons. The table below gives the quantities and values of rice exported from 1913-14 onwards.

TABLE NO. 64.—*Quantities and values of rice exported from Bombay from 1913-14 onwards.*

Year.	Quantity.	Value.
	Tons.	£
1913-14	28,884	283,545
1914-15	25,276	256,024
1915-16	30,959	322,098
1916-17	72,657	797,509
1917-18	113,464	1,299,425
1918-19	104.635	1,526,504

The considerable increase in the figures from 1916-17 onwards is in consequence of larger shipments to the Persian Gulf and East Africa, chiefly of rice railed across India, because there was no freight offering in Calcutta or Rangoon direct to these destinations.

The unit of sale and of shipment is the bag of 168 lbs. gross.

(2) Karachi.

The following table shews the quantities and values of rice exported from Karachi to foreign countries from 1913-14 onwards.

TABLE No. 65.—*Quantities and values of rice exported from Karachi to foreign countries from 1913-14 onwards.*

Year.	Quantity.	Value.
	Tons.	£
1913-14	53,739	489,004
1914-15	41,345	402,652
1915-16	49,399	469,390
1916-17	77,363	759,487
1917-18	82,742	822,735
1918-19	51,817	729,507

There is comparatively little rice grown in the hinterland served by Karachi and the average value of shipments did not exceed £300,000 before 1913-14, when a good harvest in Cutch stimulated foreign exports, the chief customers being Ceylon, Aden, Mauritius, Red Sea ports, Muscat and Persia. Subsequent developments were due to the same causes as have been specified in the case of Bombay, but the embargo imposed in September 1918 on shipment of rice from Burma ports to Calcutta affected despatches in 1918-19.

The unit of sale in the Karachi market is the candy of 656 lbs. and shipment is made in bags of 2 or 2½ maunds nett.

Wheat.

Production.

Though India produces about one-tenth of the world's wheat, this food grain is an indispensable article of food in the Punjab only. In other provinces extension of cultivation has been dictated rather by the prospects of profitable export to Europe than by internal demand. The five principal countries exporting wheat in pre-war times were the United States of America, Russia, Canada, the Argentine Republic and India in that order. As regards production, India occupied the third place with about a third of the American crop and nearly double that of Canada.

TABLE No. 66.—*Production and exports of wheat according to countries in 1914.*

Countries.	Production.	Exports.	Percentage of exports to production.
	Tons.	Tons.	
United States of America	23,816,885	4,647,300	20
Russia	15,324,047	2,368,500	16
India	8,336,484	694,680	8
Argentine Republic	4,498,215	963,000	21
Canada	4,311,015	1,879,200	44
TOTAL	56,286,646	10,552,680	19

The variety of wheat most commonly cultivated in India is *triticum vulgare*. The larger part of the Punjab crop is under irrigation, particularly in the new canal colonies. Little or no labour saving machinery is yet employed in the wheat fields and the crop is hand-reaped. On land liberally manured and irrigated, yields of from 1,500 to 1,600 lbs. per acre have been obtained but the crop is liable to damage by rust if there is rain or cloudy weather in February. On dry (*i.e.*, unirrigated) lands 800 lbs. would be a fair average crop.

Harvesting of the crop begins in March and April and winnowing continues until the end of May. In a good year the surplus crop is at once brought up by exporters and no time is lost in putting it on the European market where it bridges the interval between the antipodean harvests of South America and Australia and those of northern latitudes. Good prices are often procurable for early shipments as they arrive at a time when home stocks are practically exhausted. The rush of wheat from the threshing floor to the ports is therefore concentrated in normal years to May, June, July and August and shipments thereafter except when a good monsoon coincides with a brisk European demand. are comparatively small.

TABLE No. 67.—*Monthly exports of wheat during the last six years from Karachi.*

Months.	1913.	1914.	1915.	1916.	1917.	1918.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
January	91,909	18,670	23,561	409	37,199	12,446
February	40,931	8,994	21,450	819	14,116	1,942
March	23,340	8,479	7,337	724	19,212	50,677
April	13,005	7,016	3,939	3,100	77,467	43,109
May	97,971	21,771	1,109	1,958	132.685	63,645
June	198,691	166,997	20,498	41,569	138,069	75,839
July	256,639	168,447	27,621	43,408	192,410	55,583
August	98,130	418,223	5,726	74,470	148,661	122,050
September	105,043	55,967	1,906	136,832	135,620	39,793
October	35,966	87,742	139	140,370	147,738	10,465
November	32,832	54,615	106	72,315	31,724	935
December	18,896	36,494	186	94,641	14,761	461

In years of plenty the cultivators in the Punjab are generally anxious to realise their money in order that they may pay off advances. satisfy Government dues and avoid the risk of loss from weevils by storage in the monsoon. In years of famine the local price is generally so high that the parity of prices in Europe is exceeded and the volume of exports falls to a very low figure. In a good season the percentage of exports to outturn may be 10 per cent., in a year of scarcity. such as 1908-09, the percentage may fall below 2 per cent.

In the five years ending 1912-13 the area under wheat in India averaged 27 million acres with an annual outturn in the neighbourhood of 8 million tons.

Acreage.

The wheat exports of the statistical year are mainly drawn from the crop of the previous year, and in the table which follows this is recognised, as the export figures indicated against each year in the table stand for quantities that actually went forward only in the following year.

TABLE NO. 68.—*Area, yield and exports of wheat in India in the last quinquennium.*

Year.	Area.	Yield.	Exports.
	Acres.	Tons.	Tons.
1913-14	28,475,000	8,358,000	706,383
1914-15	32,475,000	10,087,000	652,879
1915-16	30,320,000	8,652,000	748,914
1916-17	32,940,000	10,234,000	1,454,375
1917-18	35,487,000	9,922,000	476,103

The estimated area and yield in 1918-19 were 23,764,000 acres and 7,502,000 tons.

India's participation in the world's wheat market dates from 1870, when the opening of the Suez Canal brought the wheat fields of the United Provinces within thirty days of Europe.

Marketing.

In the early days of the trade the wheat grown in those provinces was railed down to Calcutta for shipment until the extension of the railway system enabled Bombay to compete, and then with the expansion of irrigation in the Punjab the trend of exports has gradually drifted north-westward and Karachi where, it is claimed, the cost of handling and storage is lower than at Calcutta or Bombay, has now assumed a commanding position. Wheat is bought at centres upcountry, such as Lyallpur, and bagged and railed down to Karachi where it is sold by the candy of 656 lbs. including bags, manipulated and stored before shipment chiefly to the United Kingdom. Shipment is usually made in bags of 2 cwts. nett. In Bombay sales are made per candy of 756 lbs. and wheat is shipped in bags varying in weight from 182 to 224 lbs. nett. Quotations to the United Kingdom are generally per quarter of 492 lbs nett. Typical descriptions on the Karachi market are—*white*, including 5 per cent. barley, 3 per cent. dirt, 30 per cent. red, *red*, including 5 per cent. barley and 3 per cent. dirt and superior grades, *white* and *red* with admixtures in each case of 2 per cent. barley and 1½ per cent. dirt only. Though the chief varieties of wheat exported from India fall within the definition of *soft* wheat commercially, there are *hard* wheats (red and yellow) grown in Central India which find a market in Marseilles and Italy, where they are used in the manufacture of macaroni. In the general absence of wheat elevators, Karachi with a rainfall that seldom exceeds five inches has great advantages over Bombay where the

monsoon rains are heavy and the general humidity throughout the year much higher. The wheat awaiting shipment in Karachi can be stored at the docks in open sheds with very little risk of damage by rain.

Indian wheat at one time had the reputation of being dirty, but it was established that this was not due so much to careless threshing or handling as to deliberate adulteration to conform to the practice of the English grain trade. Since 1907 there has been a marked improvement in the quality of Indian wheat owing to the new contract of London Corn Trade Association being on the basis of an admixture not exceeding 2 per cent. of other food grains (in practice chiefly barley) but free from dirt. A specimen of the contract at present in force will be found in Appendix VII.

Exports. The distribution of the exports of wheat, among the three principal ports interested, are shewn in the next table. Exports on Government account are included.

TABLE No. 69.—*Exports of wheat from 1913-14 onwards.*

Principal ports.		1913-14	1914-15	1915-16	1916-17	1917-18	1918-19
		Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Karachi		893,324	693,229	526,146	679,196	1,084,201	410,127
Bombay		235,640	11,532	78,622	61,814	242,749	39,613
Calcutta		73,191	1,616	46,104	7,904	126,409	25,362
TOTAL	QUANTITIES	1,202,205	706,383	652,879	748,914	1,454,375	476,103
	VALUES £	8,755,571	5,546,944	5,627,106	6,102,321	12,668,511	4,502,032

The principal recipient for Indian wheat has always been the United Kingdom, and before the war France and Belgium also participated to some extent. From 1917-18 onwards considerable quantities have been shipped to Egypt 'for orders.'

Wheat prices are always expressed in India by the number of *seers* (of 2·05 lbs.) sold for a rupee and the higher the figure the cheaper the wheat.

Government control. There was a general rise of wheat prices all over the world as soon as war was declared and Indian bazaar prices moved up in sympathy. In October 1914 the Government of India by ordinance gave authority to Local Governments to inquire into stocks and take over if necessary any unreasonably withheld. As this did not stay the upper trend of prices, it was decided to restrict the export of wheat and wheat flour from December 1914 to March 1915 to 100,000 tons. Prices nevertheless continued to soar and in February 1915 were 45 per cent. above the level of the previous July. The promise of an excellent harvest then steadied the market and the measure of increase was reduced to 21 per cent. by the end of March.

In April 1915 the Government decided to prohibit all private exports of wheat so as to remove the link between the Indian and the world market, and created a special appointment of Wheat Commissioner to secure the most advantageous terms for the exportable surplus. While this control was in force the firms which had previously been engaged in the shipment of wheat to Europe were appointed buying agents for the Wheat Commissioner at a fixed commission, the maximum prices to be offered to sellers upcountry being fixed by Government from time to time and gradually reduced so as to discourage speculative hoarding. The total quantity purchased on Government account between April 1915 and May 1916 when the arrangements were altered, exceeded 525,000 tons, of which 458,057 tons were shipped from Karachi, 40,870 from Bombay and 29,606 from Calcutta.

With effect from 1st May 1916 shipment on private account was once more permitted up to the limit of quarterly allotments fixed by the Wheat Commissioner on the basis of pre-war business, but this arrangement only continued until the end of October when the Royal Commission on wheat supplies assumed control and made direct purchases until February 1917 and then the Wheat Commissioner was again invested with entire responsibility for buying operations. The wheat harvest of 1917 beat all previous records and in 1917-18 no less than 1,454,400 tons were exported, exclusive of 25,600 tons shipped on military account. The Wheat Commissioner on behalf of the Royal Commission purchased 1,578,346 tons in 1917-18.

TABLE No. 70.—*Purchases in 1917-18 on behalf of the Royal Commission tabulated according to provinces of origin and port of shipment.*

Province of origin.	Quantity.	Port of purchase and shipment.*	
	Tons.		
Punjab	814,001		
Sind	57,888		
United Provinces	457,427	Karachi	1,173,854
Central India	41,854		
Central Provinces	92,544	Bombay	275,566
Bombay	15,000		
Bihar and Orissa	13,312	Calcutta	128,926
Bengal	2,420		
Rajputana	1,083		
Uncertain (probably Central India or Central Provinces).	82,817		
TOTAL	1,578,346		

* Shipment not completely effected within the year.

It was estimated that with the exception of 80,000 tons from the Punjab all these exports were of the 1916-17 crop. This wheat was purchased on a sterling basis per quarter *f.o.b.* at rates fixed by the Wheat Commissioner, the freight arrangements being in the hands of the Home Government. Though control was maintained in the following year, purchases on behalf of the Royal Commission were very restricted, aggregating 384,545 tons only, of which 331,464 tons were shipped from

Karachi, 229,304 tons were of Punjab wheat and 125,978 tons of wheat from the United Provinces.

The widespread failure of the rains in 1918-19, though it affected the wheat harvest of the Punjab but little, caused a general rise in the price of all food grains in Northern India and to meet the situation the Government of India arranged to take over some of the large stocks of Australian wheat which the Royal Commission had purchased some time ago. but for which no freight could be found. The arrival of the first shipments of this wheat coinciding with the new harvest in India, helped to bring down the level of prices and was a salutary warning to those who had been hoarding grain in anticipation of yet further enhancement of prices. During the four months March to June 1919 arrivals of Australian wheat at Indian ports aggregated 168,000 tons.

Wheat flour.

The exports of wheat flour correspond pretty closely, when uncontrolled, to those of wheat. The products of the mills are known by the vernacular names *maida, atta* and *sujji* which are statistically shown under the common head of wheat flour. These names represent three grades of flour in order of fineness. *Sujji* is the round, granular meal of inferior quality obtained by grinding wheat which has been moistened overnight and then passing it through a sieve, the bran mixed up with it being later on separated by winnowing. It is used chiefly for making a sort of coarse porridge and as a constituent in certain bazaar sweetmeats. The other two qualities are obtained by regrinding *sujji* and passing it through a second sieve, the finer flour resulting being called *maida*, and the coarser *atta*. While the former is the luxury of the richer classes, the latter baked into coarse cakes called *chappattis* comprises the main food of the poor in many parts of India. The chief destinations for wheat flour before the war were Egypt, Asiatic Turkey, Mauritius, Aden, Ceylon, the Straits Settlements and the United Kingdom, the variety generally shipped being *atta*.

TABLE No. 71.—*Exports of wheat flour (quantities and values) from 1913-14.*

Year.	Quantity.	Value.
	Tons.	£
1913-14	79,412	884,068
1914-15	53,985	611,922
1915-16	58,608	746,812
1916-17	70,156	865,287
1917-18	71,568	1,006,249
1918-19	30,942	543,022

Unit of sale and shipment.

The principal ports concerned in export are Karachi, Bombay and Calcutta in that order. The unit of sale and shipment in Karachi is the bag of 164 or 196 lbs., the latter being the basis of the unit common in Bombay as well. In Calcutta sales are made on the basis of the bazaar maund and the flour is shipped in bags of 164 or 224 lbs. nett.

Barley.

Barley (*hordeum vulgare*) is chiefly grown in the United Provinces and Bihar. The total area under the crop in British India in 1917-18 was 7 million acres in addition to about four hundred thousand acres in Native States chiefly Jaipur, Alwar, Bharatpur and Gwalior. Of the four million acres in the United Provinces the greater part is in the Ghorakhpur, Benares, Lucknow and Allahabad divisions. Barley is a *rabi* crop sown in October or November and reaped in March or April. Arrivals in the upcountry markets begin in April and business is brisk till July.

Area.

There is such a large internal demand that the volume of exports has never attained any considerable dimensions and Indian barley plays a very humble part in the world market for the grain, though the volume of Indian exports responds at once to any shortage of supplies in the United Kingdom. In 1912-13 as much as 615,177 tons were exported of which 82,872 tons went from Bombay, 154,420 tons from Calcutta, and 377,874 tons from Karachi. The imports of barley in the same year were 720 tons chiefly into Karachi.

Exports.

TABLE No. 72.—*Quantity and value of barley exported during the last six years with the share of the different ports.*

Ports.	1913-14.	1914-15.	1915-16.	1916-17.	1917-18.	1918-19.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Karachi	127,622	28,865	159,533	172,034	347,747	215,305
Calcutta	54,249	54	74	1,478	97	43
Bombay	8,519	394	6,147	35,929	10,787	10,999
Rangoon	10	4	3	5	91	4
Total Quantity	190,400	29,317	165,757	209,502	358,722	226,352
Total Value £	1,043,799	174,548	1,168,003	1,509,615	2,693,512	1,845,111

Practically the whole of the exports go to the United Kingdom, but the feature of the trade in the last two years has been the shipment of over 320,000 and 205,000 tons to Egypt 'for orders.'

The unit of sale in Bombay is the candy of 27 Bombay maunds and in Calcutta the bazaar maund. The wholesale price is generally quoted in Karachi at so much per candy of 656 lbs., and the usual allowance for refraction is 3 per cent. Shipment is made in bags, the weights varying at each port—164 or 184 lbs. in Karachi, 123 or 186 lbs. nett in Calcutta and 168 lbs. in Bombay. Quotations for export to the United Kingdom are generally per quarter of 400 lbs. gross.

Unit of sale and shipment.

Pulses.

Under the same statistical heading are grouped a great many food grains, the most important being *arhar*, lentils, *dhal*, beans and peas, the three last of which being distinguished by a great number of varieties which are marketed. For gram* which is also a pulse separate figures are maintained. The lentil or *masur* (*lens esculenta*) is a valuable pulse grown as winter crop all over India, especially in the Central Provinces, Madras and the United Provinces. Flavoured with aromatics and condiments it largely disappears in internal consumption. *Arhar* (*cajanus indicus*) or pigeon-pea is generally grown in India as a mixed crop particularly in rotation with cereals. As it enters largely into the vegetarian diet of high caste Hindus, its economic value is great though the volume of exports is negligible. *Dhal* is a common term applied to the split grain of a large variety of pulses, the most common being *pisum sativum* and *phaseolus mungo*. Peas and beans are also of many types, *e.g.*, Rangoon or white beans, French beans, kidney beans, white and green peas.

Trade varieties.

The Burma white bean (*phaseolus lunatus*) is locally known as *pebugale*, the trade in which is large and important. The harvesting of white beans begins in February or March but those grown on the islands left when the river falls are not gathered till April or May and these are of superior quality. They are shipped as brought from the cultivator, and though formerly utilized as feeding stuff for cattle are now largely used for human consumption. As the war progressed an enhanced demand arose for Burma beans to take the place of the haricot beans so largely grown in the Danubian provinces from which the Allies were temporarily cut off, and large quantities were purchased by the Belgian Relief Commission and shipped to Europe.

Rangoon beans.

No separate statistics of acreage or production of any of these pulses are maintained, but the aggregate outturn must be very considerable as every bazaar in India contains one or more varieties of pulse. The extent of the export trade is illustrated in the following table.

Exports.

TABLE No. 73.—*Quantity and value of pulses exported from India from 1913-14.*

Year.	Quantity.	Value.
	Tons.	£
1913-14	114,628	711,009
1914-15	88,115	676.143
1915-16	110,035	972,159
1916-17	167,939	1,750,203
1917-18	229,724	2,438.578
1918-19	50,618	446,745

* See page 153.

The principal ports participating in the trade are Calcutta, whose share in 1913-14 was 50 per cent. though subsequently much reduced, Rangoon, Bombay, Karachi and Madras. The main recipients are the United Kingdom, Ceylon, Mauritius, the Straits Settlements and Japan though in pre-war days large quantities found their way into Germany, Holland and Belgium. The increased exports of white beans from Burma is evidenced by the fact that Rangoon accounted for 75,000 and 77,000 tons respectively out of the totals for 1916-17 and 1917-18 against an average for the three preceding years of 30,000 tons. Over 80 per cent. of beans exported goes to the United Kingdom, Japan being the next best customer.

Unit of sale and shipment.

The unit of sale and of shipment varies for these pulses in all the ports. In Calcutta sales are made on the bazaar maund, in Karachi on the candy of 656 lbs. and in Bombay on the candy of 28 Bombay maunds. Quotations for shipments to the United Kingdom are generally based on the quarter of 504 lbs. gross. Shipment is made from Calcutta in bags of 164, 210 or 224 lbs. nett while Karachi adopts bags of 164 lbs. and 206 lbs. nett. Bombay ships in bags of 168 lbs. nett. For Burma beans the customary unit of sale is a hundred baskets of 69 lbs. each and shipment takes place in bags of 180 to 280 lbs. nett.

Millets.

A number of important food crops grown in India fall within the category of millets, the most important being *jawar* (*sorghum vulgare*) the great millet, yielding an excellent grain which is the staple food of the agricultural population of the Madras and Bombay Deccan and the adjoining districts of Hyderabad. There are considerable areas under the crop in the Central Provinces and United Provinces and to a smaller extent also in Burma. The harvested straw constitutes a popular fodder crop for cattle, but the plants if grazed or cut when immature are sometimes poisonous in their effects. A smaller variety known as *bajra*, the bulrush or spiked millet (*pennisetum typhoideum*) is scarcely less widely cultivated. Neither of hese millets is at any time extensively exported.

The following table shows the exports of jawar and bajra during the last six years.

TABLE NO. 74.—*Quantity and value of jawar and bajra exported from India from 1913-14 onwards.*

Year.	Quantity.	Value.
	Tons.	£
1913-14	84,294	576,164
1914-15	105,206	743,441
1915-16	41,845	288,102
1916-17	36,301	261,217
1917-18	15,322	120,300
1918-19	5,396	56,182

The principal ports from which shipments are made are Bombay, Karachi and Rangoon and the principal destinations are Aden, Egypt and the United Kingdom among British and Asiatic Turkey, Arabia and Italian East Africa among foreign countries. Restricted shipments to the first-named destination account for the drop in the export figures for 1918-19.

Unit of sale and shipment.

The unit of sale in Karachi is the candy of 656 lbs. and of shipment, the bag of 164 and 206 lbs. nett. Sales are made in Bombay on the basis of a candy of 27 Bombay maunds, but the unit of shipment varies for jawar and bajra, the former being shipped in bags of 154 to 168 lbs. nett and the latter in bags weighing 168 to 180 lbs. gross. The unit of sale in Rangoon is a 100 baskets of 62 lbs. each.

Gram.

Area.

Gram (*cicer arietinum*) is probably the most important of the pulses grown in India, being sown over an area of about 13,000,000 acres of which the United Provinces account usually for about half, but the crop is important also in Bengal, Bombay, and the Central Provinces, but not in Southern India. The new crop comes on the market generally in April, and the bulk of the business is put through before the rains. It should be carefully distinguished from the horse-gram (*dolichus biflorus*) grown so largely in Southern India as a substitute for oats.

Exports.

As in the case of other pulses gram enters so largely into local consumption wherever it is grown that exports even in years of plenty are comparatively limited.

TABLE No. 75.—*Quantity and value of exports of gram from 1913-14.*

Year.	Quantity.	Value.
	Tons.	£
1913-14	69,597	415,104
1914-15	23,298	156,195
1915-16	32,494	224,590
1916-17	38,223	275,465
1917-18	327,063	2,328,532
1918-19	282,193	2,233,414

The ports participating in the trade are Karachi, Calcutta, Bombay and Rangoon and the principal destinations are the United Kingdom, Ceylon, the Straits and Mauritius among British and France among foreign countries. Before the war Germany absorbed fairly large quantities. The very considerable increase in 1917-18 and 1918-19 is to be accounted for by enhanced shipments to Egypt on Government account 'for orders' and also to Italy.

The unit of sale is the same as for barley,* but shipment is made from Calcutta in bags of 164 or 218 lbs., from Karachi in bags of 2 cwts. nett and from Bombay in bags of 168 to 180 lbs. gross. Gram is sold in Rangoon per 100 baskets of 65 lbs. each and shipped in bags weighing 180 to 280 lbs. nett. Quotations to the United Kingdom are generally per quarter of 504 lbs. gross.

Unit of sale and shipment.

Maize.

Garden plots or patches of maize or Indian corn (*zea mays*) may be found practically all over India, but extensive cultivation is confined to the United Provinces, Bihar and Orissa, Punjab, Bombay and the Central Provinces. The total area under the crop during the last five years averaged 6,400,000 acres with an estimated annual production of 2,200,000 tons. The new crop begins to appear in upcountry markets towards the end of October and trading is brisk from November to March.

Area.

The greater part of the crop is locally consumed and the exports, at no time important, have been gradually dwindling in recent years, owing probably to larger Argentine harvests.

Exports.

TABLE No. 76.—*Quantity and value of maize exported from 1913-14 onwards.*

Year.	Quantity.	Value.
	Tons.	£
1913-14	2,881	13,969
1914-15	1,429	8,191
1915-16	4,066	14,332
1916-17	24,877	163,083
1917-18	91,014	631,489
1918-19	13,761	104,832

In 1916-17 with the Argentine supplies practically cut off from Europe by difficulties of tonnage and the submarine menace in the South Atlantic, there was a great expansion of business due to heavy purchases on Government account towards the close of the year. In 1917-18 with these conditions persisting, the total shipments were thirty times the pre-war normal, chiefly to the United Kingdom, Egypt 'for orders' and Greece. In 1918-19 with a general shortage of foodstuffs apprehended in India, owing to the failure of the south-west monsoon the volume exported shrank to a seventh of that achieved in the previous year. Exports are chiefly from Karachi, Rangoon and Calcutta in normal times, but there have latterly been little or no shipments from the last-named port. The United Kingdom has always absorbed more than three-fourths of the exported quantity, while Japan was in former years a constant customer though she has taken nothing during the war.

* See page 150.

The unit of sale in Calcutta is the bazaar maund and maize is shipped in bags of 2 maunds nett. In Rangoon the unit of sale is a hundred baskets of 55 lbs. each and that of shipment, bags of 180 to 280 lbs. nett. In Karachi sales are based on the candy of 656 lbs. and shipment is effected in bags weighing 206 lbs. nett. Quotations for export to the United Kingdom are generally based on the quarter of 480 lbs. gross.

Oats.

Cultivation.

The cultivation of oats (*avena sativa*) for the grain is confined mainly to the Delhi and Hissar districts of the Punjab and the Meerut district of the United Provinces where it is grown as a *rabi* crop, but it is raised also to a limited extent in the Poona, Ahmednagar, Satara and Ahmedabad districts of the Bombay Presidency. Elsewhere it is more frequently cut green for cattle fodder. No separate statistics of area or production are maintained and the foreign export trade is normally small in comparison with that of other grains produced in the country, as the following table indicates.

TABLE NO. 77.—*Quantity and value of oats exported from 1913-14 onwards.*

Year.	Quantity.	Value.
	Tons.	£
1913-14	469	3,391
1914-15	670	5,580
1915-16	2,664	24,548
1916-17	791	8,240
1917-18	700	6,575
1918-19	431	5,409

Very nearly 60 per cent. of the exports go from Calcutta and the balance from Bombay. The chief recipients in pre-war days were Mauritius and Ceylon, but in 1915-16 nearly 1,500 tons found their way to Australia, a market which did not receive any shipments in the previous quinquennium.

The unit of sale in Calcutta is the bazaar maund and shipment is made in bags weighing 2 maunds. In Bombay sales are made on the candy of 28 Bombay maunds and shipment is effected in bags weighing 1½ to 1¾ cwts. nett.

OIL SEEDS.

Exports in general.

The importance and value of the trade of India in oilseeds has only recently been generally recognised. The annual production of seeds is estimated at over 5,000,000 tons with an aggregate value of £50,000,000, and if 1913-14 be taken as an average year, the exports were equivalent in quantity and value

to one-third of the total. If the exports of the residual cake and oil are added, *viz.*, 3,250,000 gallons of oil and 175,000 tons of cake, the aggregate of India's annual trade under this head may be placed at £18,000,000.

Seeds.

The following tabulated statement will give some idea of the actual percentages of the world's demands for seeds that are met by Indian sources of supply.

TABLE No. 78.—*Share of India in the world's trade in oilseeds.*

Seeds.	Total exports from producing countries.	Exports from India in 1913-14.	Per cent.
	Tons.	Tons.	
Linseed	1,808,000	414,000	23
Groundnut	779,000	364,000*	46
Cotton seed	858,000	284,000	33
Rape and Mustard seed	385,000	254,000	66
Castor seed	135,000	135,000	100
Sesame seed	264,000	112,000	42
Copra	537,000	38,000	7
Mowra seed	33,000	33,000	100
Poppy seed	25,000	19,000	76
Nigerseed	4,000	4,000	100

* Including exports from Pondicherry.

Pre-war distribution of trade.

About one-third by weight of the total exports was absorbed by the United Kingdom, but only a fifth in point of value as the principal items are the relatively cheap seeds, linseed (157,300 tons), cotton seed (279,200 tons) and castor seed (55,000 tons) out of a total of 508,270 tons. France and Germany, on the other hand, which claimed no more than a fourth and an eighth respectively of the total exports, accounted for one-third and one-sixth of the aggregate value of the trade. France's total of 455,250 tons was made up mainly of groundnut (222,400 tons) and linseed (115,500 tons), the only other considerable item being rapeseed (53,900 tons). The disproportion between weight and value in Germany's figures was likewise due as in the case of France, to the preponderant share taken of the more valuable seeds and in particular of copra (24,000 tons) and mowra (28,400 tons) though her appropriations of linseed (48,300 tons) and rape (58,200 tons) were also considerable. Apart from these three main consumers, Belgium took 98,900 tons of rapeseed and 38,500 tons of linseed, while Italy imported chiefly linseed (30,700 tons) and sesame (14,300 tons) and Austria-Hungary sesame (19,300 tons) and groundnut (10,700 tons).

Contracts for the United Kingdom.

The bulk of the oilseeds for the United Kingdom are sold under the terms of the contracts framed by the Incorporated Oilseeds Association on a pure basis. A specimen of this Association's linseed contract will be found in Appendix VIII.

Of very much smaller importance were the exports of oil from India, the value of which in 1913-14 was rather less than £400,000. The United Kingdom was the best all-round customer, but 50 per cent. of the exports of castor oil went to Australia and New Zealand and 44 per cent. of the exports of coconut oil to the United States of America.

Oils.

A great quantity of oil is of course required for internal consumption. Though most of the vegetable oils manufactured are extracted by crude processes in mills worked by bullocks or in hand presses, yet the number of well-equipped modern mills for oil crushing is on the increase, and the quality of the linseed oil exported from India is higher than of any imported into India from the United Kingdom and commands a higher price. In the dry zone of Burma, where there has been a great expansion in recent years of groundnut cultivation, the development of the crushing industry on up-to-date lines has been taken up chiefly by European agency.

TABLE No. 79.—*Exports of oils from India in 1913-14 and the principal recipients.*

Oils.	Quantity exported.	Value.	Principal recipients.
	Gallons.	£	
Coconut oil	1,091,477	155,073	United States of America, the United Kingdom, Germany, Sweden, Belgium, Holland.
Castor oil	1,007,001	92,504	Australia and New Zealand, Straits Settlements, Mauritius, the United Kingdom and Ceylon.
Mustard and Rape oils	407,178	48,624	Mauritius, Natal, Fiji and British Guiana.
Groundnut oil	288,190	30,013	Ceylon, Mauritius, France.
Sesame oil	208,053	28,699	Maskat, Aden, Ceylon and German East Africa.
Linseed oil	102,360	17,493	New Zealand, Hongkong, Australia, the United Kingdom.
Cotton seed oil	2,507	347	The United Kingdom.
Other vegetable oils	135,321	12,900	Germany, Belgium, Ceylon, the United Kingdom.

The value of India's trade in oil-cakes was at the outbreak of war in the neighbourhood of £1 million sterling annually, the principal recipients being the United Kingdom, Ceylon and Japan, which together accounted for six-sevenths of the whole. The United Kingdom absorbed 32,000 tons of groundnut cake, chiefly for cattle fodder, out of 62,000, and Japan 45,000 tons of rape cake for manurial purposes.

Oil-cakes.

Linseed.

The two features of the cultivation of *linum usitatissimum* in India are (1) that it is cultivated entirely for its seed and not for its fibre, and (2) that practically all the seed and the resultant oil and cake are exported. The plant is identical with the flax of Europe, but having long been cultivated for its seed only is sown much more sparsely than on the Continent and has developed a branching habit of growth which would render it useless, or, at any rate, greatly lessen its value as fibre. When sown experimentally for flax in India special seed has always been procured from Europe.

Production.

The average production of seed in the triennium 1912, 1913, and 1914 exceeded half a million tons of which 80 per cent. was exported, and this proportion may be taken as a normal percentage of exports. In 1904-05 nearly 560,000 tons were shipped and India held practically the monopoly of the world's production, but since then the increased competition of the Argentine Republic, the United States of America, Canada and Russia had, when the war broke out, reduced India's share of the world's trade to 30 per cent. No linseed is grown in Madras and the principal producing areas are Bihar and the United Provinces, Bengal and the Central Provinces. The total area under cultivation in the provinces for which forecasts are available is about 3,500,000 acres inclusive of a mixed crop of about 600,000 acres in the United Provinces, but in years of scarcity such as 1913-14 and 1918-19 the total is much reduced. In addition, linseed is grown in certain other tracts in British India, the average for the past five years being 34,000 acres yielding 4,000 tons of seed.

TABLE No. 80.—*Acreage under cultivation according to provinces from 1913-14 onwards.*

Provinces.	1913-14.	1914-15.	1915-16.	1916-17.	1917-18.	1918-19.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Central Provinces and Berar	952,100	1,224,000	1,048,000	1,176,000	1,257,000	516,000
United Provinces	240,600	266,000	295,000	330,000	362,000	69,000
	**367,000*	**620,000*	**650,000*	**675,000*	**695,000*	**321,000*
Bihar and Orissa	652,900	624,000	663,000	704,000	736,000	595,000
Hyderabad State	412,600	234,000	288,000	321,000	341,000	216,000
Bengal	193,700	182,000	181,000	157,000	144,000	144,000
Bombay (including Indian States).	173,100	126,000	176,000	169,000	161,000	80,000
Punjab	39,000	49,000	32,000	32,000	39,000	31,000
TOTAL Acreage	3,031,000	3,325,000	3,333,000	3,564,000	3,797,000	1,972,000
TOTAL Yield Tons	386,200	397,000	476,000	526,000	515,000	229,000

* Mixed crop.

The very considerable reduction in area in 1918-19 is due to unfavourable conditions at sowing time.

The crop is sown either pure or mixed and the fair average yield may be taken at 300 lbs. to the acre. There are two readily recognised varieties grown, which yield the commercial varieties known as *yellow* and *brown* linseed respectively. The bulk of the linseed which is marketed is of the variety known as brown, which is graded into *bold, medium* and *small*. Bombay exports chiefly bold and small, and Calcutta, medium. The exports from Karachi which are small approximate to those from Calcutta in quality. Yellow linseed is exported only from Bombay and is generally sold with an admixture of 'bold brown' which may amount to as much as 80 per cent. This yellow seed is mostly shipped to Marseilles where it is preferred to the usual Bombay bold quality on account of the lighter colour of the resultant oil cake which commands a slight premium in that market. Probably the total crop does not exceed 4,000 to 5,000 tons in a year.

Trade varieties.

Linseed, as has been noticed, is grown in India solely to meet a foreign demand. The first mention of export from India occurs in 1832 when 3 cwts. were recorded. By 1839 the figure had risen to 60,000 tons and in 1880-81 to 300,000 tons. The exports since 1904-05 are shewn in the following table.

Exports.

TABLE No. 81.—*Quantity and value of exports of linseed from India from 1904-05.*

Year.	Quantity.	Value.
	Tons.	£
1904-05	559,100	4,219,150
1905-06	289,443	2,743,693
1906-07	218,941	2,173,238
1908-09	160,477	1,703,520
1910-11	379,552	5,593,492
1912-13	354,489	5,388,383
1913-14	413,873	4,457,998
1914-15	321,576	3,502,411
1915-16	192,987	1,982,782
1916-17	399,193	4,836,051
1917-18	146,112	1,785,307
1918-19	292,453	4,391,402

Linseed is generally shipped throughout the year but the busy season runs from May to July.

The fall in 1914-15 may be accounted for by the partial elimination of Belgium and the Central Powers though the United Kingdom took nearly 50,000 tons more. In 1915-16 there was a further and more substantial contraction with greatly reduced exports to France and Italy and with shipments to the United Kingdom back to the pre-war level. In 1916-17, however, when an abundant crop coincided with a great shortage of supplies from the Plate, a recovery to 400,000 tons was achieved and in the following year, owing to smaller supplies arriving

at the ports from the provinces and partly because of the curtailed demands from the chief importers, the United Kingdom (who reduced her quantity by two-thirds), France and Italy, the total that left the country was very small. In 1918-19, on the other hand, the result of the war on the oilseed trade of the United Kingdom was fully evident and the increased stimulus imparted to the production of margarine and edible oils to replace butter and to the manufacture of glycerine for explosives, attracted larger exports of linseed from India. The British Ministry of Food made an arrangement by which imports from India were purchased by a Director of Oils and Seeds Supply in London with the Collectors of Customs as agents at the ports concerned to supervise shipments. The total quantity that went to the United Kingdom in 1918-19 was 242,000 tons or nearly 83 per cent. of the exports from India. The distribution of the trade among the principal importing countries in the last pre-war year and in 1918-19 is illustrated by the following table.

TABLE NO. 82.—*Distribution of the trade in linseed among principal importing countries in 1913-14 and in 1918-19.*

Countries.	1913-14.		1918-19.	
	Quantity.	Percentage.	Quantity.	Percentage.
	Tons.		Tons.	
United Kingdom	157,315	38	242,316	83
France	115,459	28	6,667	2
Germany	48,326	11·5	..	..
Belgium	38,459	9·3	..	..
Italy	30,657	7·4	13,381	5
Holland	9,575	2·3	..	..
Austria-Hungary	6,500	1·5	..	..
Australia	3,360	·7	18,692	6
Other countries	4,222	1·3	11,397	4
TOTAL	413,873	100	292,453	100

In pre-war days the average exports to Germany were 30,000 tons annually, but in 1913-14 she took, it will be noticed, nearly 50,000 tons and there is reason to believe that her direct imports were largely supplemented by indirect shipments *viâ* Belgium and Holland.

The principal ports interested in the shipment of linseed are Bombay and Calcutta, the share of each in 1913-14 being 51 per cent. and 48 per cent. respectively.

Unit of sale and shipment.

The unit of sale in Calcutta is the bazaar maund and in Bombay the cwt., while sterling quotations are for the ton of 2,240 lbs. nett. *l.t.** or *c.i.f.* Shipments are made from the former port in single B twill bags of 164 lbs. or double E bags of 186 lbs. nett. In Bombay the unit of weight ranges from 168 to 196 lbs. gross.

* *i.e.*, landed terms.

Linseed oil. The oil content of linseed varies from 37 to 43 per cent. Of the seed retained in the country for conversion into oil the bulk is dealt with in the country mills by primitive methods but increasing quantities are now consumed in factories working on modern lines under European management, their average annual consumption being placed at from 30 to 40 thousand tons. Production figures for the three leading mills in the neighbourhood of Calcutta for the twelve months ending September 1918 were 1,311,867 gallons. The following table illustrates the course of the export trade.

TABLE No. 83.—*Quantity and value of exports of linseed oil from India from 1910-11 onwards.*

Year.	Quantity.	Value.
	Gallons.	£
1910-11	316,111	42,594
1911-12	249,975	49,966
1912-13	106,867	20,823
1913-14	102,360	17,493
1914-15	132,796	27,869
1915-16	280,850	47,274
1916-17	178,257	32,829
1917-18	560,176	127,592
1918-19	1,674,958	431,017

Hongkong, Australia and New Zealand between them appropriate two thirds of the exportable surplus, and the quantities taken by the United Kingdom are almost negligible. The falling off in the volume of exports after 1910-11 is due chiefly to the opening of a mill in Melbourne for crushing linseed and the consequent decline in the Australian demand for oil. At the same time the exports of seed to Australia rose from 700 tons in 1910-11 to 15,850 tons in 1917-18. The recovery in 1917-18 and the phenomenal exports in that year and in 1918-19 are due to a very strong demand, particularly from Australia for oil, in view of the restrictions placed upon shipments of seed. An interesting feature of the trade returns is the steady importation of linseed oil from the United Kingdom at prices lower than the *f. o. b.* price of oil manufactured in India though charged with freight, insurance, etc. This may be due to the price paid for seed from the Plate before the war and the rates obtainable for the cake by millers in England permitting of the sale of the oil at rates considerably below the cost of manufacture in India, but generally speaking the best Indian oil enjoys a higher reputation in the local market than the imported oil which is chiefly used for industrial purposes where first quality oil is not required. Between 1910 and 1917, the largest import was in 1913-14, *viz.*, 440,000 gallons and the average for the period 330,000 gallons.

The unit of sale in Calcutta is the gallon and shipment is made in half-cases of 72 lbs. or in drums of 45 lbs. or barrels containing 360 lbs. The bulk of the shipments goes from Calcutta, in the neighbourhood of which the principal mills are situated. The distribution of the trade among the ports is shown below.

Unit of sale and shipment.

TABLE No. 84.—*Share of the principal ports in the export of linseed oil from India in 1918-19.*

Ports.	Quantity.	Percentage.
	Gallons.	
Calcutta	1,231,668	73·4
Bombay	442,790	26·3
Rangoon	500	·2

Exports of linseed, rape and sesame cakes were until the statistical year 1918-19 grouped under one head when the compilation of separate returns for linseed cake were arranged for, and their combined value average £400,000 a year. The course of the trade during the last six years is illustrated in the following table. The figures for linseed cake in 1918-19 are for the sake of uniformity merged with those of rape and sesame.

Linseed, rape and sesame cake.

TABLE No. 85.—*Quantity and value of linseed, rape and sesame cake exported.*

Year.	Quantity.	Value.
	Cwts.	£
1913-14	1,789,777	542,837
1914-15	1,024,710	345,411
1915-16	936,022	318,089
1916-17	1,109,435	348,666
1917-18	599,687	206,626
1918-19	456,406	226,901

The provincial distribution of exports in the last pre-war year was as follows. War conditions would vitiate any comparisons with figures for subsequent years.

TABLE No. 86.—*Provincial distribution of exports of linseed, rape and sesame cake in 1913-14.*

Provinces.	Quantity.	Value.
	Cwts.	£
Bengal	1,096,147	263,340
Madras	473,458	215,453
Bombay (including Sind)	174,282	60.681
Burma	15,656	3,363

The main destinations were the United Kingdom, Ceylon and Japan where the cakes are used for manurial purposes. Most of the linseed cake goes from Calcutta, during the twelve months ending March 1919 as much as 54,894 cwts. valued at £20,000 being shipped from this port to the United Kingdom, Ceylon, Java and Hongkong. The rape cake is mostly consumed by Japan.

The unit of sale for these cakes in Calcutta is the bazaar maund and in Bombay the cwt. Shipment is made from Calcutta in bags of 164 and 224 lbs. nett, while in Bombay the unit is the bag of 180 lbs. gross and in Madras the bag of 164 lbs.

Groundnut.

The groundnut (*arachis hypogaea*) also known as pea nut, earthnut and monkey nut is, though long cultivated in India, probably not indigenous. The appearance of the Indian nut in Europe dates from about 1840, but forty years later the total exports amounted to less than 1,300 tons or little more than 1 per cent. of the aggregate imports into France.* Of 112,000 acres under the crop at this time 70,000 were in Bombay and 34,000 in Madras. In 1895-96 the corresponding figures were, Bombay 164,000 and Madras 243,000 acres. In the last decade of the nineteenth century the trade suffered from a very marked set-back due, it is said, to the marked deterioration of the so-called indigenous varieties of seed, which led to a great contraction both in Madras and Bombay in the area cultivated with groundnut, the acreage in the former Presidency declining from nearly 300,000 to less than 100,000 acres. But the successful introduction of disease-resisting seed from Senegal and Mozambique with a much higher oil content is reflected in a remarkable recovery which dates from 1900-01, and under the further stimulus of an increased world demand for seeds yielding edible oils, the trade progressed steadily, particularly in Southern India, until in 1913-14 the total area devoted to the crop was not less than 2,100,000 acres, with an estimated yield of 749,000 tons. The figures for subsequent years are given below.

TABLE No. 87.—*Acreage and yield of groundnut in India from 1913-14 onwards.*

Year.	Acreage.	Yield. Tons.
1914-15	2,413,000	947,000
1915-16	1,673,000	1,058,000
1916-17	2,334,000	1,196,000
1917-18	1,933,000	1,033,000
1918-19	1,312,000	490,000

* O'Conor's report on the cultivation of groundnut in India. Journ. Agri. Hort. Soc, ed. 1879, Vol. VI, nos. 97-98.

During the war several causes contributed to fluctuations in the acreage under cultivation. At first there was a marked fall in prices, disorganisation of the labour market at Marseilles and the closing down of several French mills which caused a considerable contraction in area in 1915-16, and after a good recovery in the following year high freights and the almost complete suspension of sailings to Pondicherry and the smaller Madras ports which in pre-war times were responsible for so considerable a portion of the exports led to a further set-back. Fortunately, however, the yield when the area was smallest, was so abundant that the estimated outturn of the previous year was actually exceeded and in 1917-18 the fall in acreage was to a great extent made good by a heavier crop. Of the 1,933,000 acres under the crop in the latter year, Madras claimed 1,412,000, Burma 249,000 and Bombay 272,000. In 1918-19 there was a further fall in acreage and yield due to failure of rains at sowing time, and the crop since then suffered from drought in Madras and Bombay.

The following table gives the total exports of groundnuts, oil and cake from India during the last six years.

TABLE No. 88.—*Exports of groundnuts, oil and cake from British India from 1913-14 onwards.*

	1913-14.	1914-15.	1915-16.	1916-17.	1917-18.	1918-19.
Groundnut . (Tons)	278,000	138,000	175,000	147,000	115,000	17,000
Groundnut cake „	62,000	64,000	82,000	54,000	50,000	56,000
Groundnut oil (Galls.)	288,000	223,000	373,000	982,000	1,057,000	590,000

On an average 3 cwts. (36 gallons) of oil represent 10 cwts. of nuts crushed.

Exports of nuts.

The greater portion of the nuts produced in the country is consumed in India, the volume of exports scarcely keeping pace even in normal times with the increased cultivation. Taking the figures for the last pre-war year, *viz.*, 1913-14, it is found that considerably more than half the crop was retained for home consumption, only 278,000 tons out of 749,000 being sent out of the country. In 1914-15 the exports amounted to 138,000 out of 947,000 tons and in 1915-16 to 175,000 tons out of 1,058,000 tons. Yet in normal times the total exports from India compared very favourably with exports from the other principal producing countries of the world. When the exports from Pondicherry (chiefly grown in British India) are added to those from British Indian ports the total in 1913-14 accounts for 364,000 tons out of a grand total of 779,000 tons of the world's exports, the principal consuming country being France with a percentage share of 68. The following table shows the percentage borne by exports to outturn in each of the three provinces in which the crop is grown.

TABLE No. 89.—*Relation of provincial outturn to exports on basis of figure for 1913-14.*

Provinces.	Estimated yield of nuts.	Exports of nuts and oil.*	Percentage of exports to yield.
	Tons.	Tons.	
Madras†	411,300	287,277	69
Bombay	249,500	53,672	21½
Burma	88,000	26,969	31
TOTAL	748,800	368,000	49

* Converted at the rate of 36 gallons=10 cwts. of nuts crushed.
† Including Pondicherry.

In the table which follows the Pondicherry returns are excluded.

TABLE No. 90.—*Quantity and value of exports from British Indian ports of groundnuts during the last six years and the principal destinations.*

Destinations.	1913-14.	1914-15.	1915-16.	1916-17.	1917-18.	1918-19.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
France	222,380	109,108	165,799	121,215	38,849	2,553
Belgium	16,608	3,243	...	...	...	...
Austria-Hungary	10,706	6,972	...	...	...	...
Germany	9,436	3,790	...	...	...	...
Italy	1,225	6,353	2,928	3,047	...	2,029
United Kingdom	480	4,348	2,520	16,475	17,949	416
Other countries	17,072	4,508	4,196	26,713	58,536	12,200
TOTAL Quantity	277,907	138,322	175,443	147,450	115,334	17,199
TOTAL Value £	3,254,246	1,515,608	1,668,957	1,699,701	1,238,247	249,891

Imports of groundnuts into the United Kingdom from all destinations during the first ten months of 1917 were of the aggregate value of £3,500,000.

Shipping.

The decorticated kernels are generally shipped from Madras in bags weighing 80 kilogrammes, equal to 176 English lbs. nett, and are sold in Marseilles in francs per unit of 100 kilos. The groundnuts both in the shell, and decorticated, are usually sold in the more southerly producing districts of the Madras Presidency at so much per French candy of 529·109 English lbs., but in the northern area the unit is the English candy of 500 lbs. Sterling quotations are generally per ton of 2,240 lbs nett. *c.i.f.* Until recent years the universal method of decorticating was to damp the groundnuts and beat them with sticks to separate the brittle shells from the kernels, a method which involves considerable damage to the latter. Further, once the kernels have been wetted they are liable to discoloura-

tion and fermentation, when the oil produced from them is rancid. The use of machinery for decorticating is growing in popularity, as by this method the seed is decorticated in the dry state and the kernels are uninjured, and consequently command a much better price in foreign markets than hand decorticated kernels. There are several satisfactory types of decorticators, and the percentage of seed for export now decorticated by machine instead of by hand is increasing every year.

The best grades of oil in Europe are obtained from nuts shipped in the shell, but this method is not general from India owing to the heavy sea freights. The nuts when shipped in the shell occupy nearly double the space on the steamer than they take when shipped as kernels, and in this respect India is handicapped in comparison with the west coast of Africa where, the freight consideration being negligible, the bulk of the crop has always been shipped undecorticated. The want of adequate facilities for shipping at the minor ports in the Madras Presidency is a drawback to the South Indian trade, steamers having to lie at considerable distances from the shore owing to the shallow and surf-beaten nature of the coast and the cargo has to be carried from the shore in lighters and small boats which facilitates peculation. If the tendency of the war is maintained, an increasing portion of the trade will be diverted to Madras where adequate storage accommodation is now forthcoming at the port. The provincial percentage of that port has risen from 36 in 1913-14 to 79 in 1917-18.

Groundnut oil.

Before 1916 when the Burma figures swelled the total for the first time, practically the only shipments of groundnut oil from India were from Madras and for the use of Indian *coolies* working in Mauritius and Ceylon. The bulk of the oil crushed is still consumed internally for domestic purposes, but one of the results of war conditions has been a substantial increase in the foreign exports of oil from India, though the figures for 1918-19 are disappointing. If, however, the gallonage is converted into the weight of seeds assumed necessary to produce it, according to the formula already given, it will be seen that the oil exported still represents an almost negligible percentage of the total tonnage. The oil content of the shelled kernel is about 40 per cent.

TABLE No. 91.—*The percentage share of the exports of groundnuts and oil to the total yield in India in 1913-14 and in 1917-18.*

Year.	Yield. Tons.	EXPORTS.			
		NUTS.		OIL.	
		Tons.	Percentage to yield.	Gallons converted into tons.	Percentage to yield.
1913-14	749,000	364,000	48·5	4,072	·53
1917-18	1,042,000	120,000	11·5	15,107	1·45

The question of further expansion of seed crushing in India on up-to-date lines seems only to be limited by the difficulty of finding more remunerative markets for the cake. Machine-pressed cake is regarded with more favour by agriculturists in India as a cattle feed than the produce of country mills, because it is less adulterated, but four-fifths of the cake retained in India is used for manurial purposes and only one-fifth as fodder. The bulk of the groundnut cake exported is taken by the United Kingdom and to a smaller extent by Ceylon, though before the war Germany was participating to some extent in the trade. Burma's principal customer is the United Kingdom while Ceylon, where the cake is admirably suited for tea plantations, relies for her supplies on Madras and Bombay. A large trade is developing in the export of cake to Java. In the home market, the cake from the East Indies is known by the name of *Coromandel* to distinguish it from *Rufisque* derived from the African nut.

Groundnut cake.

Taking the provinces, where groundnut is cultivated, in order of their importance, we find that in Madras the annual acreage is about 1,600,000, yielding on an average about half a ton of unshelled nuts per acre, or between 400,000 and 500,000 tons of kernels. The general trade name for the nuts exported from Southern India is *Pondicherry* which are classed as *small*, while a *bold* grade of the *Bombay* nut (*i.e.*, shipped from that port) is also recognised. The crop is sown between July and September and comes into sight commercially between January and March. France took 88 per cent. of the exports in pre-war days, no other country taking more than 4 per cent. The exports to Marseilles between 1st October 1913 and 30th September 1914 from Madras ports (in bags of 164 lbs.) are shewn in the table subjoined.

Madras.

TABLE No. 92.—*Exports of groundnuts to Marseilles and all ports between 1st October 1913 and 30th September 1914 from Pondicherry and Madras ports.*

Ports.	Marseilles.	All ports.
Pondicherry	980,264	1,151,749
Madras ports —		
Madras	603,821	971,435
Cuddalore	482,292	649,993
Porto Novo	339,504	381,002
Negapatam	308,028	378,246

Figures for subsequent years would be unreliable as an indication of the normal distribution of the trade, as owing to the limited freight offering at the Coromandel ports while the war lasted, France and the United Kingdom had to rely increasingly upon supplies from Senegal. The entire West African crop was purchased by the French Government in 1918-19, which reacted on the trade of the Presidency to such an extent that exports in this year were only a twentieth of the pre-war average. Of 8,429 tons shipped, Pondicherry accounted for 5,349 tons.

Foreign exports of groundnut oil from Madras ports amounted in 1913-14 to 280,000 gallons valued at £29,000 of which 48 per cent. went to Ceylon and 50 per cent. to Mauritius. In 1917-18 the total was 626,242 gallons, but with France eliminated and the United Kingdom a smaller buyer the total for 1918-19 shrank to the pre-war level. Machine-pressed oil does not fetch such good prices as that pressed in *chekkus* (country mills) which is cold drawn. It is generally sold per candy of 500 lbs. and shipped in casks containing 350 to 400 lbs. Cochin casks holding 700 to 750 lbs. have gone out of favour and are now rarely used on account of their greater liability to leakage. There is further a large coastwise export of groundnut oil from Madras averaging in the four years preceding the war over two million gallons annually. It is of lower quality than the oil expressed in Burma and is largely used to adulterate *ghi* and other vegetable oils, and for Indian confectionery.

The foreign exports of cake in 1913-14 amounted to 472,000 cwts. valued at £106,000 of which Ceylon took about half for manurial purposes, and 38 per cent. went to Germany. The cake is sold either per ton or per candy of 500 lbs. and shipped in bags containing 1½ cwts. nett.

Burma.

During the last fifteen years Burma has evinced a growing interest in the cultivation and crushing of groundnut. The centre of the trade is at Myingyan in the dry zone. The estimated yield in Burma in 1913-14 and the following year was in the neighbourhood of 90,000 tons from an acreage of 258,000. In 1915-16 the total soared to nearly 120,000 tons and the estimate for 1916-17 was only slightly less. Exports from Burma for the corresponding periods were respectively (1913-14) 538,254 cwts., (1914-15) 37,993 cwts., (1915-16) *nil*, (1916-17) 43,160 cwts. indicating the complete disappearance of foreign trade in 1915-16 and a partial recovery in the following year. Burma's chief pre-war customers were France, Hongkong and Austria-Hungary. In spite of the fact that owing to the closing of these markets the entire output for 1915-16 was available for use within the province itself, coastwise imports from Madras aggregated 2,000 tons of nuts and 420,000 gallons of oil. Exports of nuts to foreign countries in 1917-18 and 1918-19 amounted to 20,537 cwts. and 5,222 cwts. respectively.

The exports of cake from Rangoon to the United Kingdom were also considerable, *viz.*, 38,000 tons valued at £147,000 in 1915-16, 27,000 tons in 1916-17 but only 1,100 tons in 1917-18. The foreign exports of Burma oil which are of superior quality to Madras oil amounted in 1915-16 to 77,000 gallons and the following year to 495,000. In 1917-18 the total was 297,990 gallons of which 211,336 gallons went to the United Kingdom. In 1918-19 with shipments to the United Kingdom practically suspended the aggregate was only 76,836 gallons.

The unit of sale of the nuts is a hundred baskets of 25 lbs. each and of the oil and cake, a hundred viss of 360 lbs. The kernels are shipped in bags of 150 lbs. nett, the oil in casks of 80 gallons and the cake in bags of 200 to 224 lbs. nett.

Bombay Presidency.

The groundnut trade in Bombay has not made anything like the headway it has in Madras since the beginning of the present century. In 1895-96 three quarters of the groundnuts exported were shipped from Bombay: in 1917-18 they represented less than 38 per cent. of the whole.

The centres of groundnut cultivation in the Bombay Presidency are Sholapur and Satara and the area under the crop in 1918-19 was 116,000 acres (inclusive of 21,000 acres in Native States, chiefly Kohlapur) equivalent to about 10 per cent. of the total area under the crop in British India. The average yield on the basis of figures for the five years ending 1917-18 is 260,000 tons. The crop in Bombay is sown about six weeks earlier than in Madras and is harvested about November. Two grades of nut are recognised, *bold* and *small* which are sold either shelled or unshelled. The following table illustrates the volume of the trade in groundnuts, oil and cake from the Presidency between the years 1912-13 and 1918-19.

TABLE No. 93.—*Exports of groundnuts, oil and cake from Bombay Presidency from 1912-13 onwards.*

Articles.		1912-13.	1913-14.	1914-15.	1915-16.	1916-17.	1917-18.	1918-19.
Groundnut	Tons	48,802	53,670	21,178	24,176	78,394	43,224	6,042
Groundnut oil.	Galls.	1,079	166	8,421	25,035	24,128	11,397	132,384
Groundnut cake.	Tons	2,554	8,031	5,112	11,061	5,748	3,312	4,263

In the last pre-war year, more than 50 per cent. of the nuts went to France, the balance being divided mainly between Belgium and Germany, the share of the United Kingdom being only 40 tons. In 1916-17, however, the United Kingdom percentage of the trade rose to 20, the major quantity still finding its way to France, *viz.*, 59,000 tons. Bombay suffered less than Madras ports and Rangoon from the shortage of freight in this year, and her total shipments of groundnuts were considerably higher than in the years preceding the war. The trade in oil since 1914-15 has been mainly directed to Ceylon and Mauritius which together accounted for 90 per cent. of the total. The United Kingdom and Germany were the only two customers for the cake in 1913-14, the greater part to the former. After the elimination of the German market, 85 per cent. of the exportable surplus has been diverted to Ceylon, and the balance only to the United Kingdom.

The unit of sale in Bombay for groundnuts is the candy of 20 Bombay maunds, for oil, the maund of 28 lbs. or the cwt. and for cake, the cwt. Shipment of the decorticated nuts is made in bags of 168 to 182 lbs. and the undecorticated nuts in bags weighing 85 lbs. or less, while

the oil is packed for export in tins of 84 lbs. or drums of 6 or 8 gallons. Cakes are shipped in hydraulic pressed bags of 180 lbs. or in native pressed bags of 161 or 168 lbs. Sterling quotations for the nuts are generally based on the ton of 2,240 lbs. nett. *c.i.f.*

Rape and Mustard Seed.

Trade varieties.

The term rapeseed is commercially often indifferently used to denote at least two sub-species of *brassica campestris, viz.*, Indian colza or *sarson* and Indian rape or *toria*, while mustard seed is derived from a closely allied species, *brassica juncea.* The chief qualities of rapeseed recognised by the exporters are *toria*, brown bluish in colour, chiefly exported from Karachi, *Ferozepore brown*, *brown Cawnpore*, chiefly shipped from Bombay and Calcutta, *brown Delhi*, mainly exported from Bombay and Karachi, *yellow bold*, from Bombay and *yellow small* from Bombay and Calcutta.

Area and production.

Excepting for a small area devoted to mustard seed in the south, for which no separate figures are available, the cultivation of rape and mustard is entirely restricted to Upper India, the average acreage under the two crops, inclusive of mixed cultivation in the United Provinces, being estimated at 6,000,000 acres, of which the United Provinces account for 40 per cent., Bengal 22 per cent., Punjab 19 per cent. and Bihar and Orissa 10 per cent. The actual figures for 1917-18 were considerably more than this estimate, *viz.*, 6,924,000 acres. The crops are grown either pure or mixed almost entirely on unirrigated land and are sown in October or November and gathered in February or March. The total annual outturn of rape and mustard seed has been put at 1,260,000 tons, equivalent to 4 cwts. only per acre, but when rape is cultivated by itself as a pure crop the yield is probably appreciably higher. In parts of the country the crop is cut green in January for cattle fodder. In upcountry markets the bulk of the crop is disposed of between March and July and the principal trade centres are Cawnpore in the United Provinces and Ferozepore in the Punjab where supplies are collected for export *viâ* Bombay and Karachi.

Export of rapeseed.

India has always been the principal source of the rapeseed imported into Europe in supplement to the supplies of Russia (chiefly ravison) Roumania (chiefly *colza*) and France. The other countries contributing to the world's exportable surplus in recent years are China and Japan, and to a modest extent Argentine and the Dutch East Indies also. In pre-war years the proportion of exports to total production was about 20 per cent. or 240,000 tons per annum. Most of the seed grown in Bengal and Bihar would appear to be retained for local consumption, and the principal exporting centres were Karachi and Bombay. The figures for all ports are combined in the table below.

TABLE No. 94.—*Exports of rapeseed from India from 1913-14 onwards.*

Countries.	1913-14	1914-15	1915-16	1916-17	1917-18	1918-19.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Belgium . . .	98,869	26,861	..	..	..	..
Germany. . .	58,199	8,107	..	..	..	..
France . . .	53,943	20,593	40,279	23,426	2,739	10,729
United Kingdom .	14,099	24,681	47,473	89,021	36,900	54,488
Italy . . .	13,726	14,757	6,374	4,758	225	4,068
Japan . . .	1	10	160	4,629	19,211	9,905
Other Countries .	10,163	1,903	10,928	438	234	472

Though Belgium was, before the war, nominally the principal market there is little doubt that a great deal of her imports *viâ* Antwerp found their way eventually to Holland and Germany. The latter's average annual consumption has been estimated at 143,000 metric tons, of which it is calculated India contributed 83 per cent.*

The effect of the war on the trade was very perceptible. In 1914-15 only 97,000 tons were exported as against 249,000 tons in the previous year, a partial revival being experienced only in 1916-17 when 122,000 tons were sent out of the country. Of this the greater portion was taken by the United Kingdom and France, both of which countries formerly relied for their supplies on Russia to a great extent. There was a great set-back again in 1917-18 owing to lack of tonnage, so far as Bombay and Karachi were concerned. The United Kingdom trade was reduced by two-thirds and that with France practically disappeared, but Japan's increasing interest in the crushing of rapeseed for oil drew away a considerable quantity of this seed from Calcutta, as well as from Bombay.

Unit of sale and shipment.

The unit of sale in Karachi is the candy of 656 lbs. and in Bombay the cwt. Shipment is made from Karachi in bags of 164 to 206 lbs. nett, from Bombay in bags of 168 to 182 lbs. and from Calcutta in gunnies of 164 or 186 lbs. Sterling quotations are generally on the basis of the ton of 2,240 lbs. nett., *c.i.f.*

Exports of mustard seed.

The average quantity of mustard seed exported does not usually exceed 5,000 tons a year and even that is believed to contain a large admixture of rapeseed. In the last pre-war year it was 5,104 tons and in 1916-17, 6,074 tons. The bulk of the exports go from Bombay packed in bags of 168 to 182 lbs., and France is the chief customer, more than 50 per cent. being appropriated by her every year. Occasional shipments were made to Germany in pre-war days. From South India there is a small trade with Ceylon and to a lesser extent with France, and before

* Bulletin of the Imperial Institute, Vol. XV., No 3, July—September, 1917, page 384.

the war, Belgium and Germany, the ports of export being Madras, Cocanada, and Tuticorin.

The unit of sale in Bombay is the candy of 22½ Bombay maunds.

Rape and mustard oil.

Large quantities of rape and mustard seed are annually crushed in India for local consumption in the form of oil which is commonly used, particularly in Bengal, for cooking purposes and generally by Hindus to anoint the body. Indian seed is assumed to yield from 42 to 45 per cent. of oil. Mustard oil is not uncommonly adulterated in the bazaars, if not for the export market, with gingelly, mowra and *pakra* which is obtained from the seeds of *schleichera trijuga* (*kusumb*). The refining of rapeseed oil, as colza is refined in Central Europe for the manufacture of margarine, has not yet been taken up in India. Exports from India averaged about 400,000 gallons (including mustard oil) of which practically the whole went to British Possessions and nearly three-quarters to Mauritius and Natal alone for the Indian *cooly* population in those colonies. In 1915-16, 352,969 gallons out of a total of 465,735 gallons went to these two destinations. Large quantities are also sent and for the same reason to Fiji and British Guiana. In 1916-17 the total quantity of oil exported exceeded 574,000 gallons and in 1917-18, 488,000 gallons, while in 1918-19 there was a drop to 265,600 gallons.

Karachi and Calcutta are the principal ports concerned in the export. The unit of sale is the Indian maund at the former port and the bazaar maund at the latter, while shipment is made from Calcutta in drums of 45 lbs. or half cases of 72 lbs. and from Karachi in tins of 17½ to 18 seers.

Rapeseed cake.*

Rapeseed cake though accepted on the Continent as cattle fodder is chiefly used in the United Kingdom for manurial purposes. Another principal market for Indian rape seed cake before and during the war has been Japan and since 1913-14 a fresh market has been found in the Straits Settlements to a small extent.

TABLE No. 95.—*Quantities and values of rapeseed and mustard seed and rape and mustard oil exported from India during the last six years.*

Articles.		1913-14.	1914-15.	1915-16.	1916-17.	1917-18.	1918-19.
Rapeseed—							
Quantity . .	Tons	249,005	96,912	95,214	122,272	59,309	79,662
Value . . .	£	2,851,711	1,083,719	938,576	1,187,448	588,378	968,811
Mustard Seed—							
Quantity . .	Tons	5,104	2,553	3,178	6,192	1,894	1,888
Value . . .	£	70,724	40,400	55,778	119,174	41,135	48,817
Rape and Mustard oil—							
Quantity . .	Gallons	407,178	413,189	465,735	574,696	488,527	265,672
Value. . .	£	48,624	49 594	51,017	66,030	59,415	51,532

* For statistics, see page 162.

Sesame.

Area and production.

The seed of *sesamum indicum,* an annual plant thriving in the tropical and sub-tropical parts of the world and variously known to the trade as *til, teel, gingelly* or *sesame,* yields a valuable oil. The seed is generally grown in India, except in the United Provinces, as a pure crop, and a fair average yield is about 300 lbs. to the acre. In Southern India it is probably higher. Cultivation extends to almost all the provinces of India but the crop is raised most extensively in Bombay, Burma, Madras and in the Central Provinces, in the two first-named of which the acreage averages 1,000,000 and in the last two 800,000 a year. The total of India for the pure crop in those provinces for which forecasts are available, may be placed at 4,300,000 acres and the output at 375,000 tons. The following table illustrates the distribution of the crop and the annual yield from 1913-14 onwards.

TABLE NO. 96.—*Acreage and yield of sesame in India from 1913-14 onwards.*

Provinces.	1913-14.	1914-15.	1915-16.	1916-17.	1917-18.
	Acres.	Acres.	Acres.	Acres.	Acres.
Central Provinces and Berar	865,700	878,000	927,000	759,000	502,000
Bombay (including Indian States)	851,200	1,055,000	820,000	905,000	758,000
Madras	809,300	861,000	823,000	770,000	824,000
Hyderabad State	612,000	599,000	546,000	569,000	589,000
United Provinces	378,400	372,000	299,000	278,000	188,000
	†*850,000*	†*1,000,000*	†*1,100,000*	†*1,000,000*	†*850,000*
Bengal	241,000	251,000	248,000	223,000	225,000
Bihar and Orissa	219,700	206,000	196,000	189,000	144,000
Punjab	144,100	222,000	127,000	246,000	122,000
Other Provinces	104,600	121,000	22,000	75,000	69,000
TOTAL* ACREAGE	5,076,000	5,565,000	5,108,000	5,023,000	4,271,000
TOTAL* YIELD . Tons	403,500	551,000	482,000	513,000	331,000

*Burma figures are not available.
†Mixed crop.

In 1918-19, the estimated area was 3,501,000 acres and the outturn of seed 258,000 tons. The average area sown during the past five years in provinces not mentioned above in British India has been 1,232,000 acres with an yield of 90,000 tons of seed.

The new crop comes on to the upcountry markets towards the end of November and sales are heavy till March. Five qualities are known to the trade, *white, black, mixed, yellow* and *red,* of which the first-named is regarded as having the highest oil content. The chief port of export for this variety is Bombay.

Exports.

In the last pre-war year the exports of sesame seed from India amounted to 112,200 tons, only exceeded by China with 121,000 tons. About 50 per cent.

of the world's supply is found by the British Empire to which India contributes half. Between 1870 and 1890 France was the principal customer for Indian sesame and took nearly 75 to 85 per cent. of the exports, but this proportion has declined since groundnuts displaced sesame in the Marseilles market and the trade of the quinquennium 1910-11 to 1914-15 indicated an average import of only 33,000 tons out of India's total of 100,000 tons. In 1912-13 the position of the trade was as follows. The total exports amounted to 78,000 tons of which 21,700 tons went to France, and 19,000 to Austria-Hungary and about 18,000 to Belgium, other importers being Italy and Germany with very much smaller quantities. The distribution of the trade from 1913-14, the last pre-war year, is indicated in the following table.

TABLE No. 97.—*Share of the principal importing countries of sesame from 1913-14 onwards.*

Countries.	1913-14.	1914-15.	1915-16.	1916-17.	1917-18.	1918-19.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Belgium	33,800	5,500	...	...	...	...
France	22,200	13,300	9,000	51,566	4,514	150
Austria-Hungary	19,000	4,000	...	...	...	...
Germany	16,000	1,900	...	...	...	...
Italy	14,000	9,500	1,700	8,483	963	...
Ceylon	1,517	1,449	1,432	553	1,542	...
Egypt	1,242	3,685	8	80	3,117	67
Aden	879	1,599	473	642	1,537	109
United Kingdom	...	300	350	21,297	1,005	...
Other Countries	3,563	5,467	837	979	3,515	2,058
TOTAL Quantity	112,200	46,700	13,800	83,600	16,193	2,384
TOTAL Value £	1,796,841	711,885	164,170	1,091,659	230,064	47,076

There have never at any time been exports of any magnitude to the United Kingdom or to other parts of the British Empire till 1916-17 when 25 per cent. was absorbed by the former. The ports most concerned in the shipment are Bombay and Karachi on the west coast and Cocanada, Bimlipatam, and Vizagapatam on the Bay of Bengal. Of these markets Bombay is the most important. There are practically no exports from Burma as the entire crop is retained for home consumption.

Unit of sale and shipment.

In the Madras Presidency the unit of sale as well as of shipment is generally the single gunny bag of 164 lbs. nett, while in Bombay, the weight varies for shipment from 154 to 168 lbs. nett and in Karachi, the bags weigh 164, 168 or 184 lbs. nett. The unit of sale in Bombay is the candy of 20 Bombay maunds and in Karachi the candy of 656 lbs., but quotations for export are per ton of 2,240 lbs. nett., *c.i.f.*

Sesame oil.

The percentage of oil in *til* seed is assumed to be in the neighbourhood of 40. Though the oil is generally extracted in crude mills worked by bullocks the better

qualities are clear and nearly colourless. Most of it is retained in India for cooking purposes and as an illuminant or for anointing the body. The average annual export of oil from India is in the neighbourhood of 200,000 gallons in normal years, but there have been considerable fluctuations during the war. The distribution of the trade among the principal provinces in the last pre-war year is shewn below.

TABLE No. 98.—*Distribution of the exports of sesame oil according to provinces in 1913-14.*

Provinces.	Quantity.	Value.
	Gallons.	£
Bombay (including Sind)	153,680	20,991
Madras	53,102	7,520
Bengal	911	128
Burma	360	60
TOTAL .	208,053	28,699

The Bombay trade was mainly with Aden, Maskat territory, Mauritius and East Africa and the war has not created any alteration in the direction of exports. Shipments from Karachi averaged only 3,000 gallons but in 1916-17 nearly 20,000 gallons and in the following year 55,000 gallons went forward, mainly to Aden and Maskat.

In Madras the principal ports of shipment are Tuticorin for the Ceylon market and Madras, Cuddalore and Negapatam for the Straits. 65 per cent. of the oil shipped from the Presidency go to Ceylon, 21 per cent. to the Straits Settlements and 10 per cent. to Natal, and the demand is chiefly on behalf of the Indian *cooly* population in these colonies. The following table shews exports from India from 1913-14 onwards classified according to destinations.

TABLE No. 99.—*Share of the principal importing countries of sesame oil from 1913-14 onwards.*

Countries.	1913-14.	1914-15.	1915-16.	1916-17.	1917-18.	1918-19.
	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.
Maskat Territory and Trucial Oman.	63,570	63,599	48,284	69,842	68,313	27,304
Aden and Dependencies .	35,647	43,374	29,720	13,122	5,502	2,561
Ceylon	31,609	30,020	22,371	18,119	15,713	4,894
German East Africa . .	10,443	3,993	...	...	6,753	3,531
Straits Settlements . .	15,367	7,981	8,146	8,025	11,563	693
Mauritius and Dependencies	6,986	3,574	4,522	37,949	3,203	16,327
Natal	5,662	4,540	6,091	4,402	7,487	2,070
United Kingdom . .	4,196	33	5,580	4,460	4,147	79
Other Countries. . .	34,633	31,439	16,587	71,915	117,518	55,041
TOTAL . { QUANTITY	208,053	188,583	141,301	219,834	240,199	112,500
TOTAL . { VALUE £	28,699	25,462	17,490	27,695	33,046	19,557

Trade with the United Kingdom may be expected to increase with the development of the margarine industry.

Unit of sale and shipment.

The unit of sale of the oil in Bombay is the maund of 28 lbs. and in Karachi of 82⅖ lbs. Shipment is made from the former port in 2-tin cases of 84 lbs. or casks of 5 cwts. and from Karachi in tins of 17½ or 18 seers. In Madras sales are generally on the candy of 500 lbs. and shipment is made in casks of 400 to 500 lbs. In Tuticorin the oil is shipped in casks containing 80 gallons and in Negapatam in tins of 4 gallons.

Sesame cake.

There is practically no foreign market for the cake except in Ceylon, where it is used chiefly for manurial purposes. In India it is in general demand as cattle fodder either alone or in conjunction with *poonac* (coconut cake). No separate statistics of exports are maintained but the combined figures of linseed, rape and sesame cake will be found on page 162.

Cotton Seed.

Production.

In the matter of production of cotton seed, India occupies a position next only to that of the United States of America contributing annually about 2,000,000 tons to the world's total of 11,000,000, but scientific utilization of the greater part of her supplies has never yet been attempted.

Export.

Exports of cotton seed from India vary from year to year according to the season, for when there is any scarcity it is hoarded as winter feed for cattle, but even in a year of plenty they probably do not exceed 15 per cent. of the seed available. About 200,000 tons are required annually for sowing and the normal consumption in the Punjab as food for milch-cows has been estimated at about the same figure. Considerable quantities are also crushed for oil and cake, but the balance available for export should largely exceed the 300,000 tons which is the average of the three years preceding the war. The trade, such as it is, may be described as of modern growth originating in inquiries from the United Kingdom for Indian seed about the year 1900 in consequence of German competition in the Egyptian cotton seed market at a time when a scarcity of olive oil and sesame in the market and the necessity of finding substitutes for the preparation of lard and margarine coincided with the discovery of a new process of hulling the seed cheaply. From 1901-02 onwards the value of exports progressed steadily until 1913-14. In 1900-01 the total was 11,250 tons only, but it rose in the following year to 101,800 tons and in 1910-11 to nearly 300,000 tons. The figures of total quantity and value and the percentage of shipments to the United Kingdom during the last six years are given below.

TABLE NO. 100.—*Quantity and value of exports of cotton seed and percentage of shipments to the United Kingdom during 1913-14 to 1918-19.*

Year.	Quantity.	Value.	Percentage to the United Kingdom.
	Tons	£	
1913-14	284,327	1,416,743	98
1914-15	207,789	1,004,524	97
1915-16	95,664	445,077	98
1916-17	39,630	203,940	94
1917-18	1,675	9,587	*Nil*
1918-19	1,454	11,810	*Nil*

The United Kingdom percentage in 1900-01 was only 62. From 1914 onwards there has been a considerable decline in exports due partly to freight difficulties and partly to a fall in prices. About 92 per cent. of the cotton seed exported in a normal year goes from Bombay, 6 per cent. from Karachi and 1½ per cent. from Madras ports. Shipments of the seed are usually effected between January and July.

Trade varieties.

The usual qualities of seed obtainable in the market are (1) *Bombay*, (2) *Delhi-Cawnpore*, (3) *American* (from seed originally imported from America), all shipped from Bombay and known as *Bombay* in the United Kingdom market, (4) *Comilla* (Eastern Bengal) chiefly shipped from Calcutta and (5) *Rangoon*, exported from Burma. Of these (2), (4) and (5) are generally regarded as inferior as they contain a larger percentage of damaged and worm-eaten seeds. The American quality commands normally a small premium over *Bombay*, though it is the latter that is most extensively exported. Shipments from Karachi are mostly varieties (2) and (3). Indian cotton seed generally belongs to the class known as 'white' or 'fuzzy,' as in addition to the outer layer of true cotton fibre, it has on it an underlayer of fluff or lint which is not removed before shipment. It is valued in Europe on the basis of 18 per cent. oil, but the average yield of oil in India is considerably lower. In Burma the oil content is normally assumed to be 10 per cent. only.

Unit of sale and shipment.

The unit of sale in the Bombay market is the candy of 784 lbs. gross *tale quale*, while contracts with the United Kingdom are per ton of 2,240 lbs. *c. i. f.* In Karachi sales are based on the standard maund. The unit of shipment in Bombay is the bag of 140 lbs., in Karachi the bag of 123$\frac{3}{7}$ lbs. and in Madras 165 lbs., but there is a good deal of latitude at the first port in particular in the weights shipped.

Cottonseed oil.

In comparison with other vegetable oils, the production of cotton seed oil in India is very limited. The seed is not decorticated before crushing. In 1913-14 only 2,507 gallons were shipped, the entire quantity being from the Bombay Presidency, but subsequently there has been an appreciable development of the trade in Burma where a good quality of oil is produced, the residue known as *foots* being sold in Rangoon for the manufac-

ture of cheap soap. The oil is packed in Rangoon in 40-lb. tins at the factory and shipped mostly to the United Kingdom, but a promising market has also been found for it in Australia. The following table illustrates the progress of the trade which has not yet attained to any considerable dimensions.

TABLE NO. 101.—*Quantity and value of cottonseed oil exported from 1913-14 onwards.*

Year.	Quantity.	Value.
	Gallons.	£
1913-14	2,507	347
1914-15	12,471	1,059
1915-16	43,030	4,031
1916-17	84,156	10,004
1917-18	76,308	9,595
1918-19	9,356	1,183

The unit of sale in Bombay is the maund of 28 lbs. and the oil is shipped in 42 lb.-tins. Sales are made in Rangoon per 100 viss of 360 lbs.

Cottonseed-cake.

There is no considerable market in India for cottonseed cake as cattle fodder, as it is usual to give milch-cows the uncrushed seed, and it is probable that with an increased foreign demand there will be considerable quantities available for export, if progress is made meanwhile with the cotton seed oil industry. 10,000 tons valued at £50,000 were exported in 1913-14 to which Burma contributed half, though in point of production of seed her share was only 1 per cent. 90 per cent. of this went to the United Kingdom. In 1914-15 the effects of the war began to be felt and the value of the cake exported was only £31,000 and in the following year it dropped still lower to £23,000. The totals for 1916-17 and 1917-18 were £15,500 and £800, with a partial recovery in 1918-19 to £7,000. Outside Burma, the trade in cottonseed cake is confined almost entirely to Bombay whence shipment is made in bags of 168 to 180 lbs. gross. The unit of sale in Burma is a 100 viss of 360 lbs. and shipment is effected in bags weighing 200 to 224 lbs. nett.

Castor Seed.

Production.

The castor oil plant (*ricinus communis*) has long been cultivated in India, but until the beginning of the nineteenth century there were considerable imports, doubtless for medicinal purposes, of the oil and no recorded exports either of oil or seed. The trade in the Indian seed is indeed of comparatively recent growth. The plant is so widely grown over India as a mixed crop that no accurate estimate can be attempted of the area under it, but the provinces where it is principally grown are Madras (particularly in the Ceded Districts), Hyderabad State, Bombay and the Central Provinces. A fair average yield is 300 to 400 lbs. of seed per acre and the

crop takes eight to twelve months to mature. The annual outturn may be put at between 250,000 and 300,000 tons per annum. Two principal varieties of the plant are cultivated. The oil which, before the invasion of kerosene and electric light, was in scarcely less demand than coconut oil as an illuminant for the houses of Europeans and Indians alike, is derived chiefly from the large-seeded variety : the well known medicinal oil from the small-seeded. The seeds after picking are sun-dried and husked and are then ready for the market. Four chief qualities are recognised by the trade, namely *Bombay small seed* (*Deccan*), *Madras small seed* (*Deccan*), *Cawnpore* and *Calcutta*. The two first-named are very similar and only differ in the port of shipment. The characteristic of Calcutta quality is a *bold* seed, and this is even more marked in the case of Cawnpore. Neither quality gives such a high yield of oil as the smaller seed. The crop comes on to the markets upcountry in March and April but the bulk of the sales are completed by the end of May.

Exports. Though Java, Indo-China and Manchuria are beginning to grow castor on a commercial scale, India yet enjoys a practical monopoly of the world's export trade in the seed. The first recorded export was some 225 tons in 1877-78, but in the next year 11,880 tons were shipped and in 1913-14 134,888 tons. War conditions have since then emphasized the disadvantages of shipping raw material instead of the less bulky and more valuable manufactured product and while the exports of oil have shown satisfactory expansion, those of seed have fallen away. In pre-war times the United Kingdom took nearly half the exports. About 80 per cent. of the arrivals in the United Kingdom went to Hull to be crushed and the balance was re-exported to Russia and the United States. The United States trade, direct and through United Kingdom ports, has always been very steady. The volume of exports to Germany in 1913-14 was nearly 100 per cent. above the average for the previous five years.

TABLE No. 102.—*Exports of castor seed from India according to destinations from 1913-14 onwards.*

Destinations.	1913-14.	1914-15.	1915-16.	1916-17.	1917-18.	1918-19.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
United Kingdom	55,675	35,284	41,458	39,007	57,036	62,838
France	20,989	11,584	14,128	16,952	14,653	16,735
United States of America	20,279	16,083	17,720	21,067	18,194	...
Belgium	14,822	5,669	...	...	...	...
Italy	11,788	11,203	7,788	10,585	4,927	1,127
Germany	9,671	732	...	...	...	...
Spain	975	1,300	1,834	1,075	599	...
Australia	589	362	400	1,124	601	1,278
Other countries	1	598	4,620	3,337	2,027	11
TOTAL Quantity	134,888	82,815	87,948	93,147	98,037	81,989
TOTAL Value £	1,336,649	773,289	802,185	964,369	1,177,436	1,534,228

The bulk of the seed is exported from Bombay, which receives its supplies from Berar and Hyderabad as well as from the Presidency. The exports from Calcutta are usually from Bihar and the United Provinces but in the last two years of the war, a good deal of the seed shipped was railed up from the north-eastern districts of Madras whence freight was unobtainable. The Madras export trade which is small is centred at Cocanada and Madras. The small-seeded varieties locally known as *Coasts* and *Warangals* go from the former port and *Salems* which are large seeded from the latter. 13,000 tons were exported from Madras in 1917-18 to the United Kingdom for the Aircraft Board.

In 1918-19, to satisfy the increasing demands of the Air Ministry, the Director of Oils and Seeds Supply in London made arrangements for the purchase of Indian castor seed on lines similar to those for linseed. Under this scheme over 40,000 tons of castor seed were shipped from Bombay, 11,000 tons from Madras and 3,200 from Calcutta.

The distribution of the trade among the principal ports in the last pre-war year is given below.

TABLE No. 103.—*Share of the principal ports in the export of castor seed from India in 1913-14.*

Ports.	Quantity.	Percentage.
	Tons.	
Bombay	115,389	85
Calcutta	9,989	7
Cocanada	6,977	5
Madras	2,451	2

Unit of sale and shipment.

The unit of sale in Bombay is the candy of 20 Bombay maunds and in Calcutta the bazaar maund. Shipment goes forward from the former port in single B twills of 154 to 168 lbs. nett and from Calcutta in bags of 150 lbs. nett. The unit of shipment at Cocanada and Madras is the bag of 164 lbs. nett, while sales are on the basis of the candy of 500 lbs. in Madras and the bag of 164 lbs. in Cocanada. Quotations for export are per ton of 2,240 lbs. nett., *c.i.f.*

Castor oil.

Castor oil figured in India's export trade much earlier than castor seed, 20,207 lbs. being sold at the East India sales in 1804 at a price which works out at 22*s*. 6*d*. a gallon. In 1889-90, 2,664,990 gallons of oil were exported, but the primitive methods of extraction and inferior quality of the oil (due in part to deliberate adulteration) turned the scale thereafter in favour of the export of the seed and the pendulum did not swing back again until after the outbreak of war. In 1912-13 the total had fallen below a million gallons of which nearly the whole went to the United Kingdom and British Possessions, particularly to Australia and New Zealand. The figures of export from 1913-14 onwards are shown in the following table.

TABLE No. 104.—*Quantity and value of castor oil exported from 1913-14 onwards.*

—		1913-14.	1914-15.	1915-16.	1916-17.	1917-18.	1918-19.
QUANTITY	Gallons	1,007,001	898,269	1,451,655	1,724,707	2,084,959	1,658,539
VALUE	£	92,504	83,550	129,301	174,355	255,337	298,102

Even with the improvement in the volume of export between 1915 and 1918 the figures of 1889-90 were not attained, and in 1918-19 with restrictions placed upon export to the United Kingdom, there was again a set-back, though the great enhancement in price which had meanwhile taken place raised the total values above those of 1917-18. The distribution of the trade is shown in the next table. The principal features of recent years are the preponderating share of the United Kingdom, the practical elimination of Australia and the development of business with our Allies, France and Italy.

TABLE No. 105.—*Exports of castor oil from India and the chief recipients.*

Countries.	1913-14.	1914-15.	1915-16.	1916-17.	1917-18.	1918-19.
	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.
Australia	360,252	301,780	131,877	102,087	89,563	14,977
New Zealand	146,659	168,336	212,515	126,441	102,921	58,997
Straits Settlements	141,414	108,120	91,740	85,970	67,572	3,073
Mauritius	92,050	104,654	118,696	81,817	77,541	17,069
United Kingdom	87,256	53,960	698,280	1,121,935	1,086,301	893,776
Ceylon	73,730	51,524	66,872	54,920	50,459	11,930
Union of South Africa.	59,659	57,490	73,291	58,378	152,109	26,530
Siam	16,273	13,067	13,572	11,700	12,488	336
Portuguese East Africa.	8,365	18,162	13,819	5,369	20,363	...
Italy	...	2,304	...	12,567	326,345	627,173
France	...	...	1,822	2,331	...	...
Other countries	21,043	8,872	29,171	60,154	139,297	4,678

A good deal of the country pressed oil is retained for home-consumption, chiefly as a lubricant and an illuminant. Large quantities are also utilized for dressing leather and in the manufacture of Turkey red oil. A considerable quantity of Madras grown castor seed is railed to Calcutta for crushing. There are a great number of small oil mills in the neighbourhood of Calcutta working with castor, in addition to two or three European-managed concerns, the produce of which is scarcely inferior to that of Hull.

Unit of sale and shipment.

As much as 80 per cent. of the oil is exported from Calcutta and the balance from Cocanada (15 per cent.) and Bombay. In Calcutta the unit of sale is the bazaar maund and shipment is made in cases containing 17 gallons or half cases of 8½ gallons or in 5-gallon drums. The oil is shipped from

Bombay in tins or cans of 7 and 40 lbs. or in casks of 588 lbs. while Cocanada prefers the barrel of 400 lbs. nett. The unit of sale at the latter port is the candy of 500 lbs.

The total imports of castor oil into the United Kingdom averaged about 350,000 gallons in 1911—13. In 1914 and 1915 the receipts were only 196,000 and 177,000 gallons, respectively, but with the increasing demand for herself and her Allies of this oil for the lubrication of aeroplane engines the total for 1916 was over 1,300,000 gallons of which India supplied 1,220,000 gallons. In 1913 the United Kingdom exported 2½ million gallons of castor oil of her own manufacture and over 1¾ million gallons in the following year, of which, it has been pointed out,* nearly 2,500,000 gallons went to Germany in addition to nearly ten thousand tons of castor seed imported direct into that country from India. The oil content of castor seed is about 40 per cent.

Castor cake.

The actual production of castor cake is difficult to estimate, but the internal consumption for manurial purposes is considerable, particularly for tea and sugarcane. The presence of a poisonous substance called ricin, remaining in the cake after the oil has been extracted, renders it unsuitable for cattle fodder. In pre-war years the average quantity exported was in the neighbourhood of 6,000 tons.

TABLE No. 106.—*Exports of castor cake from 1913-14 onwards.*

Year.	Quantities.	Values.
	Tons.	£
1913-14	4,902	19,385
1914-15	3,947	13,839
1915-16	11,476	44,906
1916-17	9,999	46,885
1917-18	2,896	13,637
1918-19	4,284	23,297

The bulk of the shipments was made from the South Indian ports of Cocanada and Tuticorin and Madras, in that order and 95 per cent. of the whole went to Ceylon for tea estates, the unit of shipment being the bag of 164 and 196 lbs. The unit of sale is generally the bag of 164 lbs., but the candy of 500 lbs. is also employed in Madras.

Copra.

Coconuts. Area and Production.

It is estimated that the value of the products of the coconut in the world's markets in the year before the outbreak of war exceeded £70 millions or nearly double the value of the world's output of rubber. The coconut palm (*cocos nucifera*) makes four principal contributions to

* Bulletin of the Imperial Institute—Vol. XV, No. 3, July—September, 1917, p. 411.

commerce, *viz.*, (*a*) *copra*, the dried kernel of the nut, (*b*) coconut oil, the oil extracted from (*a*), (*c*) *poonac*, the residual cake, and (*d*) *coir*, the fibre derived from the husk surrounding the nut. A well distributed rainfall, a sandy soil containing plenty of decayed vegetable matter and not liable to become water logged and protection from strong winds are essential to the growth of the coconut. The mean temperature should be from 75° F. to 85° F. and the mean annual rainfall should not be less than 50 inches. Coconuts grow particularly well close to the sea but there is no reason why a plantation should not be successful up to an altitude of 2,000 feet provided that temperature requirements are fulfilled. In India the tracts where the coconut flourishes best are the Kathiawar, Kanara and Ratnagiri districts of Bombay, and Malabar and South Kanara districts and the Godavari delta in Madras, the Native States of Travancore and Cochin, the lower basins of the Ganges and Brahmaputra in Northern India and the Irrawaddy delta in Burma. No estimate can be attempted of the acreage under coconut in India but it must be very considerable.

Whereas in exceptionally well-situated areas the yield of a single tree may run up to 200 nuts, the average may be placed at 50 to 75 nuts a tree and in Malabar the outturn per acre may range from 4,000 to 5,000 nuts equivalent to one ton of copra. The acreage under coconut cultivation in the Madras Presidency has been estimated at 800,000 of which half a million acres are assigned to Malabar alone with a total annual yield of at least 800 million nuts, worth at pre-war prices over £3 millions. There are no large plantations under one management and the industry has hitherto been almost entirely in the hands of small Indian cultivators. The produce of the Coromandel coast, as of Bombay and Bengal, largely disappears in local consumption. The total internal comsumption of coconuts in India has been roughly estimated at nearly 400 million nuts a year.

The most important coconut product, copra, which is the trade name for the dried kernel of the nut, had nearly doubled in price during the five years preceding the war, though the cost of production owing to improved methods of cultivation and machinery had, in the interval, been materially reduced. The best Malabar copra is sun-dried in the sand by the sea-shore or in cemented yards (known as barbecues) under nets, the process taking from 5 to 10 days and at seasons when non-liability to damage from rain is practically assured.

Exports of copra.

The exports of copra from India though substantial do not represent more than a seventh of the world's trade in this article, and are considerably smaller than those of Ceylon, whose average exports during the years 1913—1918 amounted to 62,400 tons, valued at £1,220,000.

The value of the exports from the Malabar Coast ports trebled between the years 1908-09 and 1913-14, the actual quantity shipped in the latter year being 762,000 cwts. and in so far as this was secured at the cost of a reduction in the exports of coconut oil, there is little cause for congratulation.

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TABLE No. 107.—*Exports of copra and coconut oil contrasted from 1908-09 to 1913-14 with index number.*

Year.	Copra.		Coconut oil.	
	Quantity.	Index Nos.	Quantity.	Index Nos.
	Tons.		Gallons.	
1908-09	19,756	100	2,845,404	100
1909-10	26,701	135	2,526,328	88
1910-11	22,481	114	1,934,608	68
1911-12	31,876	161	2,165,103	76
1912-13	34,349	174	969,494	34
1913-14	38,191	193	1,091,477	38

In the five years preceding the war Germany took nearly 73 per cent. of the exports of copra and only 33 per cent. of the exports of coconut oil. The copra was crushed in the mills at Hamburg and in 1913 alone 30,236 metric tons of coconut oil were shipped to the United Kingdom for conversion into margarine. At first, as in the case of many other Indian exports, the copra trade was temporarily paralysed by the elimination of Germany as a customer, but France soon developed a greatly increased demand and there is little doubt that when normal conditions are restored Great Britain will also be an important buyer of Malabar copra. In the following table are shewn the quantities exported from 1913-14 onwards with the shares of the principal ports.

TABLE No. 108.—*Exports of copra from 1913-14 onwards, showing the share of the principal ports.*

Ports.	1913-14.	1914-15.	1915-16.	1916-17.	1917-18.
Madras Presidency—	Tons.	Tons.	Tons.	Tons.	Tons.
Cochin	27,225	19,912	7,423	12,192	4,236
Calicut	4,289	4,826	3,240	4,653	619
Badagara	4,134	4,573	3,295	2,789	...
Tellicherry	2,438	2,375	669	1,265	441
Bombay Presidency—					
Bombay	85	52	35	1,291	404
TOTAL	38,191	31,345	15,678	26,606	5,873

Exporters of copra experienced a serious set-back in 1918-19 owing to the difficulty of securing freight for such a bulky and unpopular cargo, and the only foreign shipment in the year from Madras ports was a paltry 13 cwts. to the Bahrein Islands, while the total for all India did not exceed 450 tons.

Unit of sale and shipment.

The unit of export is uniformly the bag of 126 lbs. on the west coast, the copra being sliced into small pieces and so packed, but as it loses some weight in transit (about 2 per cent. to 3 per cent.) between India and Europe, payments

are usually made on the basis of delivered weights. The unit of sale in Cochin is the candy of 600 lbs. and in Madras the Dutch candy of 672 lbs. Copra is practically all sold forward on *c. i.f.* contracts either to the United Kingdom or to Continental ports, but the majority of these contracts are put through in the commerical sale rooms in Mincing Lane, as the business is financed from London and worked almost entirely through London brokers. Curiously enough this was the case even before the war and though Hamburg by means of discriminating tariffs was able to secure the bulk of the copra offering, the actual sale to German buyers was effected through Mincing Lane so that, as far as copra prices were concerned, Hamburg was very much at the mercy of London speculators. The season for shipments lasts from October to May in Cochin and from December to May in other ports, inconsiderable shipments being also made from Madras and Cocanada.

Malabar copra has for years commanded a higher price than any other in the world's markets, partly because of its high oil content and partly perhaps because it is wholly sun-dried, while elsewhere the drying is completed artificially under cover over grills, as in Ceylon, which tends to discolour the meat, or in kilns or hot-air rotary machines.

Coconut oil.

Copra has a very high oil content and the resultant product is not only in great demand for the manufacture of edible oils and fats but also in connection with soap making. The best Malabar copra yields a higher percentage of oil than that of Ceylon, West Africa or the Philippines. Before kerosene came into general use coconut oil was India's principal illuminant. It is still widely employed for toilet purposes and in particular as a hair oil. The export trade before the war was practically confined to the Malabar littoral, where the oil, though extracted for the most part in *chekkus* or primitive country mills of the pestle and mortar type, was of excellent quality and under the trade name of *Cochin oil* commanded a premium of 15 to 20 per cent. in the world's markets as against *Ceylon oil*, perhaps because sundried copra is less liable to discoloration than artificially dried. There are now a number of power-driven concerns known as 'chuck'* mills in Cochin, Calicut and Alleppey working on practically the same principle except that the mortar and not the pestle revolves, driven by small oil engines, and a very large mill is under erection at Ernakulam, the capital of the Cochin State. While the yield of hot pressed oil is higher, cold pressed oil is of a better colour. The best Cochin oil, which is filtered before shipment, is so clear as to be scarcely distinguishable from water. The obstacle to shipment by tank steamer is the fact that coconut oil solidifies at 68° F., and until that is overcome (as is understood to have been the case with certain Philippine shipments) resort must be made to pipes or casks. The best oil from Cochin is shipped in casks of white cedar (*dysoxylon malabaricum*) weighing 15 cwts. nett which added not less than Rs. 30 per ton to the cost in pre-war times, but other units like

* A corruption of the Malayalam word 'chekku' meaning 'a small mill' mentioned above.

pipes of 15 and 20 cwts. nett, hogsheads of 4 cwts. and two-tin cases containing 68 to 74 lbs. of oil are not unknown. The unit of sale in Cochin is the candy of 600 lbs. but the price usually quoted for export is so much per ton *f.o.b.* Cochin, the ton being according to the Cochin tonnage scale of 14 cwts. In the following table the exports and the principal destinations in the last pre-war year are contrasted with those for 1918-19.

TABLE No. 109.—*Exports of coconut oil (quantity and value) and the principal destinations in 1913-14 and 1918-19.*

Destinations.	1913-14.		1918-19.	
	Quantity.	Value.	Quantity.	Value.
	Gallons.	£	Gallons.	£
United States of America	447,664	63,070	..	..
United Kingdom	223,756	31,759	5,758,293	761,118
Germany	163,632	22,857	..	..
Sweden	119,541	16,996	..	..
Belgium	43,571	6,212	..	..
British Possessions	30,132	4,687	553,623	71,866
Holland	29,283	4,116	..	..
France	8,492	1,214	24,000	2,400
Italy	5,566	795	857,033	140,589
Other countries	19,840	3,367	5,458	1,014
TOTAL	1,091,477	155,073	7,198,407	976,987

The figures for 1918-19 are swelled by the purchases on behalf of the Director of Oils and Seeds Supply, which amounted altogether to 4,486,320 gallons.

Germany always took more copra than oil against which there was a tariff wall, and the bulk of the *poonac* (coconut cake). Coco-butter of good quality has been for some years manufactured on a commercial scale at Pondicherry and sold under the name of 'cocotine,' and there is an increased demand for the oil in connection with the numerous soap factories springing upon the west coast, where the industry was successfully pioneered by Sir Frederick Nicholson.

Ports of shipment.

Up to 1913-14 the trade was almost entirely from Cochin as out of 1,091,477 gallons exported from India in 1913-14, the share of this port was 1,056,532 gallons. The exports from Ceylon in 1913 exceeded 6½ million gallons and in 1914, 5¾ million gallons. A feature of the last two years of the war has been the increase in the exports from Calcutta, where the mills to a great extent depend upon Ceylon for their supplies of copra. Whereas in 1915-16 and 1916-17 the exports of oil from Calcutta were in the neighbourhood of 23,000 gallons only, in 1917-18, the total rose to nearly 470,000 gallons and in 1918-19 to 2,500,000 gallons. The unit of shipment in Calcutta is the 5-gallon drum, or cases and half cases containing 17 and 8½ gallons of oil, respectively. The imports of copra from Ceylon into Calcutta were in 1916-17, 977 tons, as compared with 7,215 tons

and 27,131 tons in 1917-18 and 1918-19 respectively. It is doubtful whether the trade will be maintained on this scale when normal conditions are restored. The diversion of so much Ceylon copra to Calcutta to be milled is partly due to the fact that Colombo being a port of call, freight is not easily obtained when tonnage is scarce, for unpopular cargo like coconut oil. In pre-war days the consumption of coconut oil in Bengal was greater than the provincial production and statistical records reveal that there had previously been from time to time imports on a considerable scale into Calcutta from Ceylon, *e.g.*, in 1906-07 when 731,281 gallons were received.

Exports from the Madras Presidency.

The exports of coconut oil from all ports declined in the quinquennium before the war, but there was an almost proportionate increase in the shipments of copra. Whereas nearly 2,000,000 gallons went out in 1910-11, the total for 1913-14 was only 1,091,000 gallons, the corresponding totals for copra being 22,500 and 38,000 tons. The same conditions which operated generally in respect of oilseeds, and also in the case of jute manufactures led to more than a recovery in the foreign despatches of coconut oil from 1914-15 onwards. The following table gives a conspectus of the trade of the Madras Presidency in the oil during the last six years.

TABLE No. 110.—*Foreign and coastwise exports (quantities and values) of coconut oil from the Madras Presidency during the last six years.*

Year.	Foreign.		Coastwise.		Total.	
	Quantity in thousands of gallons.	Value £	Quantity in thousands of gallons.	Value. £	Quantity in thousands of gallons.	Value. £
1913-14	1,060	149,800	3,386	474,900	4,446	624,800
1914-15	1,784	239,700	3,368	380,800	5,152	620,500
1915-16	2,016	259,100	2,729	285,400	4,745	542,500
1916-17	2,019	283,500	2,398	296,000	4,417	579,500
1917-18	2,490	309,300	2,790	272,800	5,280	582,100
1918-19	3,885	464,640	3,085	392,800	6,970	857,500

(240 gallons = 1 ton.)

The coastwise trade was mostly directed to Calcutta, Karachi, Bombay and Rangoon. In 1918-19 there were considerable despatches of oil by rail to Calcutta and Bombay for foreign shipment particularly to the Ministry of Food, owing to the shortage of freight at the Malabar coast ports, but over 2,198,000 gallons were shipped direct from Cochin to the Ministry.

Poonac.

The residue of the chuck mills mixed with a little gum arabic is *poonac* or coconut cake, valuable both as a food stuff for cattle and as a manure. Most of the cake remains in the country, but before the war there was a considerable though diminishing export to Germany. At that time the value of

poonac as a cattle food was scarcely known in England, but since the war what little has been exported from India found its way into the United Kingdom.

TABLE No. 111.—*Exports of coconut cake from 1912-13 onwards.*

Year.	Quantity.	Value.
	Cwts.	£
1912-13	128,074	41,463
1913-14	84,166	26,965
1914-15	60,958	18,543
1915-16	1,417	382
1916-17	1	...
1917-18	1,152	353
1918-19	22,006	5,428

The chief ports of export were Cochin and Calicut in the Madras Presidency. The unit of sale on the West Coast is the candy of 560 or 600 lbs. and shipment is made in bundles, each containing 168 lbs. nett or in bags of 1 cwt. nett.

Other coconut products.

The trade in desiccated coconut which has attained to such considerable dimensions in Ceylon has never yet been successfully exploited in India. Charcoal made from coconut shells has been found to possess the power of absorbing gases to an extraordinary extent, and was, before the armistice, being manufactured on a considerable scale for use in anti-gas respirators. Coconut shells carbonized at a low temperature have recently been found on analysis to be exceptionally rich in acetic acid, while the ash from the shells and husks being rich in potash should make a valuable manure.

The following table shews the exports of coconut palm products from India in 1913-14 and 1918-19 respectively. In the former year there were additional exports from Travancore ports of considerable value, but laterally these have been shipped to an increasing extent from Cochin and Tuticorin.

TABLE No. 112.—*Quantity and value of coconut products exported from British India in 1913-14 and 1918-19.*

Products.		1913-14.		1918-19.	
		Quantity.	Value.	Quantity.	Value.
			£		£
Coconuts	No.	344,111	1,517	663,035	3,358
Coir fibre	Cwts	14,812	11,449	6,006	4,353
Coir manufactures	„	772,262	592,741	263,309	233,346
Cordage and rope	„	60,420	70,189	54,336	78,448
Copra	Tons	38,191	1,039,826	450	13,990
Coconut cake (poonac)	Cwts	84,166	26,965	22,006	5,428
Coconut oil	Tons	4,548	155,073	29,995	976,987
TOTAL VALUE		...	1,897,760	...	1,315,910

Mowra Seed.

Production. Mowra, mowhra or mahua seed is obtained from three species of *bassia*, viz., *latifolia*, a deciduous tree widely distributed in the Central Provinces, Chota Nagpur and Western India, the bulk of the seeds exported from Bombay and from Calcutta belonging to this variety, *longifolia* in Hyderabad and Madras, and *butyracea* grown in the sub-Himalayan tracts. Two grades of seed are recognised, known as *first* and *second* quality respectively, the former consisting of brown, yellowish seeds with a small percentage of damaged seeds, while the seeds in the latter are dark brown with anything up to 20 per cent. damaged and slightly damaged grains. The crop usually comes into sight in the month of June and the market is brisk until September.

Exports. Between 1907-08 and 1912-13 the exports of mowra seed from India averaged about 27,000 tons but the trade was marked by great variations. In 1913-14, 33,000 tons were shipped, of which Germany took 85 per cent. for soap and candle manufacture and Belgium accounted for most of the balance. In 1914-15, the crop is said to have been indifferent, and with Germany out of the market, only 7,500 tons were exported, of which over 5,000 tons went to the United Kingdom which had not hitherto taken any interest in these seeds.

TABLE No. 113.—*Export of mowra seed from India—quantities and values and principal destinations in 1913-14.*

Principal destinations.	Quantity.	Value.
	Tons.	£
Germany	28,384	309,791
Belgium	4,439	48,596
France	425	4,696
Holland	50	533
British Possessions	1	17
TOTAL	33,299	363,634

The quantities exported in subsequent years have been continually on the decline. Shipments in 1915-16 and 1916-17 averaged 4,200 tons only and practically nothing was shipped in 1917-18 or 1918-19. Nearly 90 per cent. of the shipments went from Bombay, chiefly to Hamburg and Antwerp, the balance being contributed by Madras and Calcutta in the order named. The unit of sale in Bombay is the cwt. and shipment is made in bags of 140 to 154 lbs. nett, but quotations for export are made on the ton of 2,240 lbs. nett. *c.i.f.*

A country spirit is distilled from the flowers of the mowra which are also a favourite article of food particularly in the Central Provinces.

The seeds contain a large quantity of edible oil which from the ease with which it solidifies is often called 'mahua butter.' It is largely used all over India as a *ghi* substitute or adulterant.

Poppy Seed.

Area and production.

While it is doubtful if the poppy plant would be cultivated in India were it not for the opium derivable from it poppy seed at the same time forms an important secondary crop. The decline in the area under poppy will be discussed in detail in the article on opium.* 99 per cent. of the whole acreage is in the United Provinces. The average yield per acre in the United Provinces is about 4 cwts, and on the assumption that the acreage now under cultivation is not diminished, the yield of poppy seed in India would amount to 37,800 tons annually. Three qualities are recognised *white*, *blue* and *red*, but the two latter are very difficult to obtain. The seeds come on to the market generally in April and most of the business for the year is concluded by July. A great deal of poppy seed is consumed as food and the oil is widely used for culinary purposes, while poppy cake is relished by the poorer classes and by cattle alike.

Exports.

Export figures have been on the decline since 1911-12 when 34,900 tons were exported equivalent to about 16 per cent. of the estimated available crop. In pre-war days France, where the oil is extracted by the cold process for table purposes and as an ingredient in paints, took the bulk of the crop, while hot expression yields an inferior oil used chiefly in soap making. Belgium and Germany were the only other countries interested in the trade. As in the case of other seeds dependent upon a Continental demand, there has been a very marked decline in the volume of exports since the war broke out. The percentage of oil content by weight is 30. Seeds, the capsules of which have not been scarified for opium, give a higher yield than those which have. No figures are available regarding the exports of poppy oil from India which is generally extracted by the cold process, or of the residual cake.

TABLE No. 114.—*Exports of poppy seed from India and share of the chief importing countries.*

Principal countries of destination.	1913-14.	1914-15.	1915-16.	1916-17.	1917-18.	1918-19.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
France	10,700	4,175	6,635	5,254	1,600	2,534
Belgium	4,800	1,360	...	...	...	...
Germany	3,300	960	...	...	...	...
United Kingdom	...	84	143	205	60	...
TOTAL Quantity	18,980	6,992	6,872	5,527	2,027	2,695
TOTAL Value £	310,589	95,610	82,012	63,140	23,194	50,336

The bulk of the shipments went from Bombay and the balance from Calcutta, the unit of shipment at the former port being 140, 154 and 168 lbs. gross and at the latter of 155 lbs. nett packed in single heavy C. bags. Sales are made per cwt. in Bombay and per bazaar maund in Calcutta, but quotations for export are generally per ton of 2,240 lbs. nett, *c.i.f.*

* See page 216.

Niger Seed.

Area and production.

Niger seed is obtained from *guizota abyssinica*, a native of tropical Africa which, since its acclimatisation in India, has become the chief source of European supplies. It has not and is never likely to be an article of first rate importance, as sesame which is grown in the same localities gives a better return per acre. It is a spring crop, largely sown mixed, the chief producing areas being Chota Nagpur, the Central Provinces, the Deccan and north-eastern Madras. From its resemblance to sesame it is sometimes called *kala-til* (or black sesame). The normal yield per acre may be taken at 300 lbs. and the percentage of oil to seed by weight as 35. No separate statistics of production or cultivation are available. Most of the seed is locally crushed and used for cooking, anointing the body and mixing with sesame and other more valuable oils. The relative cheapness of the oil encourages its use as an adulterant.

Exports.

The history of the export trade is one of continual decline. Shipments fell from 10,000 tons in 1911-12 to 5,000 in the following year. In 1913-14 there was again a slight shrinkage and in 1915-16 the total was no more than 589 tons. At one time half the exports used to go to the United Kingdom but in the years immediately preceding the war an increasing share of the trade was taken by Germany and Austria-Hungary. Considerable quantities were also shipped to France but since August 1914 she has practically ceased to take any. The following table shews the exports of niger seed according to destinations from 1913-14 onwards.

TABLE No. 115.—*Distribution of the trade in niger seed among principal importing countries from 1913-14 onwards.*

Destinations.	1913-14.	1914-15	1915-16.	1916-17.	1917-18.	1918-19.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Germany	2,029	591	...	...	...	...
France	1,047	5	10	...	...	...
Austria-Hungary	566	...	...	...	...	...
United Kingdom	367	1,660	381	1,673	...	10
Italy	50	26	175	...	...	...
Other countries	48	48	23	15	6	14
TOTAL { QUANTITY	4,107	2,330	589	1,688	6	24
TOTAL { VALUE £	42,926	22,154	4,823	15,743	50	492

The three ports chiefly interested in the exports in normal times were Bombay, Bimlipatam and Vizagapatam. In the last pre-war year 2,023 tons went from Bombay and 2,071 tons from Madras ports.

Unit of sale and shipment.

The seed is chiefly shipped from Bimlipatam and Vizagapatam in single gunnies containing 164 lbs. nett or 170 lbs. The usual grade of quality is fair average of season, Europe cleaned. The unit of sale in the Bombay market is the

candy of 20 Bombay maunds and shipment is effected in bags weighing 182 lbs. The London quotations are generally per quarter of 376 lbs. in Madras, but in Bombay it is the ton of 2,240 lbs. nett *c.i.f.*

Coriander.

Coriander (*coriandrum sativum*) is cultivated all over India on account of its fruit and leaves. It is sown at different seasons in different provinces, frequently as a mixed crop, and perhaps on that account no estimate of the area under the seed or the annual outturn seems to have been attempted. The fruit yields a spice and a volatile oil, while the leaves are eaten as a vegetable and form a common ingredient in curries. The exports during the last six years are shewn in the following table. The season generally runs from January to July.

TABLE No. 116.—*Quantity and value of coriander exported from India from 1913-14 onwards.*

Year.	Quantity.	Value.
	Tons.	£
1913-14	4,777	39,099
1914-15	4,203	46,327
1915-16	4,505	70,953
1916-17	4,244	68,541
1917-18	5,821	80,011
1918-19	4,839	65,347

The foreign market for the seeds is restricted because their oil content is much lower than that of the coriander grown in Eastern Europe. The bulk of the traffic is from Tuticorin and Negapatam though there are shipments also from Calcutta and Bombay, the exports being mainly directed to Ceylon and the Straits Settlements. Mauritius takes about a 100 tons annually and in 1917-18 some 700 tons went to the United Kingdom.

Unit of sale and shipment.

In Madras the unit of sale is generally the candy of 500 lbs. and shipment is made in gunnies weighing 100 or 164 lbs., while in Bombay the seed is sold per candy of 11 Bombay maunds and shipped in bags of 100 lbs. The unit of sale in Calcutta is the bazaar maund and the seed is shipped in bags weighing 164 lbs.

Cummin Seed.

Trade varieties.

Commercially there are two varieties of cummin seed distinguished in India, *viz.*, the true cummin (*cuminum cyminum*) and black cummin (*nigella sativa*), to which perhaps may be added another variety which, on account of its appearance and its vernacular name (*shiah zira*), is very often confounded with black cummin. True cummin is grown chiefly in the United Provinces and the Punjab but it is found in almost every

province, the chief trade centres being Jubbulpore, Gujarat and Rutlam. Black cummin is not so widely distributed.

Exports.

No statistics of acreage or production are available in respect of either variety, but the internal consumption of both as a spice in confectionery and curries is considerable and over 20,000 cwts of true cummin and 2,000 cwts of the black variety are exported annually, chiefly to Ceylon, the Straits Settlements and the Arabian and East African littorals. Practically nothing goes to the United Kingdom or to the Continent because of the extensive cultivation in Europe of the caraway (*carum carui*). The chief ports of export are Bombay and Calcutta.

Shiah zira.

Shiah zira (*carum indicum*) grows throughout north-western India from Kashmir to the United Provinces and large quantities of the seeds are collected by hill tribes and brought to the towns for sale to *mahajans*. It is considered superior in taste and fragrance to ordinary cummin seed and so much disappears in internal consumption that all attempts to export the seed on a considerable scale have hitherto proved abortive.

Ajwan Seed.

Ajwan seed, the source of the valuable antiseptic *thymol*, is obtained from *carum copticum*, a herbaceous plant cultivated all over India as a *rabi* crop, belonging to the same genus as caraway. Two qualities of seed are generally recognised on the market, known respectively to the trade as *Indore* and *Kurnool* of which the latter is regarded as superior. No statistics of acreage or production are available but the internal consumption is fairly large as the aromatic fruits are much in request for admixture in curries, etc., and in *pan supari*. A liquid obtained by distillation from the seeds known as *omam water* is commonly retailed in every considerable town upcountry as well as an essential oil.

Exports.

The export trade in this seed has not hitherto and now, it may be hoped, is never likely to attain any considerable dimensions. The quantities and values of ajwan seed exported from India during the last seven years are shewn in the following table.

TABLE No. 117.—*Quantity and value of Ajwan seed exported from 1912-13 onwards.*

Year.	Quantity.	Value.
	Cwts.	£.
1912-13	21,650	6,135
1913-14	9,784	2,983
1914-15	7,368	2,736
1915-16	13,062	4,871
1916-17	11,093	4,304
1917-18	3,990	2,765
1918-19	1,917	2,102

Nearly 97 per cent. of the exports go from Bombay and the balance from Calcutta, shipments from Madras being negligible. The principal recipients in pre-war times were Germany, whose distilleries absorbed 80 per cent. of the trade, the United States of America and to a limited extent Ceylon and the Straits. Little was directed to the United Kingdom in pre-war years but of the diminished volume of exports since 1913-14 as much as 25 per cent. went to that destination.

The unit of shipment is the single B twill bag of 140 lbs. nett and quotations are generally based on the ton of 2,240 lbs. nett, *c.i.f.*

Thymol.

In the process of distilling the essential oil from ajwan seed a crystalline substance separates itself and settles on the surface which is known commercially as *thymol*. It is prepared on a fairly extensive scale in Central India and sold locally as *ajwan-ka-phul* or *flowers of ajwan*. The percentage of oil in the seed is low and usually does not exceed 3 to 4. The amount of *thymol* extracted from a given quantity of seed varies from 20 to 30 per cent. of the yield of oil. High grade thymol crystals comparable with those manufactured in pre-war years in Germany are now being made successfully by two firms in India. Statistics of export previous to June 1917 are not available, but the quantity exported from Calcutta for the two years ending June 1919 aggregated 10,500 lbs. valued at £16,000. The principal destinations were the United States of America and the United Kingdom.

Bye-products.

One of the bye-products obtained from the distillation of ajwan is *thymene* which is a cheap scent utilised in the manufacture of soap. The demand in India for this oil is very limited, but in pre-war years German distillers made a profit out of the sale of thymene and the spent seed which enabled them to sell thymol itself at a price which barely covered the cost of the seed and the expenses of distillation.

The spent seed makes an excellent cattle food, but so far it has not found much favour among Indian agriculturalists.

Kardi (Safflower) Seed.

The seeds of the safflower plant (*carthamus tinctorius*), the flowers of which are utilised for the extraction of safflower dye yield, when crushed, the *kusum* or *carthamus* oil of trade. In some localities, *e.g.*, the Deccan, distinction is made between two species, one sown essentially for oil and the other for dye. The former is extensively produced in Bombay : indeed, at the beginning of the century it was regarded as perhaps the most important oilseed grown in that Presidency, the chief centres of cultivation being the alluvial loams of Ahmednagar, Poona, Satara and Bijapur. It is also widely distributed in the Central Provinces. The areas cultivated with the dye-yielding variety have shrunk in recent years owing to the competition of chemical substitutes. Safflower being chiefly grown as subsidiary to some other crop, no statistics of area or production of seed are available, and in the trade returns exports of this seed are not separately recorded.

The unit of shipment is the single B twill bag weighing 180 lbs. net and quotations are generally made on the basis of the ton of 2,240 lbs. nett, *c.i.f.* The chief port of export of the seed is Bombay and the principal destination the United Kingdom.

Carthamus oil.

The oil is extracted in two ways (1) by cold-dry pressure either before or after the seeds have been husked and (2) by crude distillation in two earthen pots, one above the other, the percentage of oil in the seed being about 25. The cold drawn oil is of a clear straw colour and it is largely used for culinary purposes, as an adulterant of *ghi* or tilseed oil and as an illuminant, while the hot drawn oil is converted into *roghan*, chiefly employed as dubbin to prevent leather from hardening on exposure to damp. The cake is excellent for fattening poultry.

TEA.

The trade in tea (the leaf of a species of *camellia*) represents a considerable proportion of the export trade of British India : and in 1917-18 amounted to 359 million lbs. valued at £11·78 millions equivalent to 7 per cent. of the total exports, an individual total only exceeded by jute, cotton, food-grains and hides and skins. With the possible exception of China, whose crop outturn it is difficult to estimate with any approach to accuracy, India is probably the largest tea producer in the world. In 1917 China exported only 150 million lbs. or considerably less than half the quantity exported from India in the same twelve months, while the exports from Ceylon in 1917-18 were 195·5 million lbs.

History of cultivation.

In the latter half of the eighteenth century, the most profitable trade of the East India Company with the United Kingdom was in tea from China, of which it had the monopoly, though the exorbitant import duty encouraged a great deal of smuggling. In 1787 over 20,000,000 lbs. were shipped and in the following year the suggestion emanated from Kew that experimental cultivation should be made in India so that in the event of trouble with the Chinese authorities an alternative source of supply might be available. Little however was done until 1834, when Lord William Bentinck, unaware that the tea plant was indigenous in Assam, warmly took up the matter, and appointed officers to proceed to China and collect tea seed and expert Chinese labour. Three missions in all were sent to China and much money unprofitably spent on exploiting imported in preference to indigenous seed. The first samples of teas grown on the Government plantations in Assam were sent to England in 1838 and the first Calcutta sale held three years later. It was not until 1852 that it was established that Indian tea was in a position to compete on the London market with China tea, but thereafter progress was so rapid that the Government's direct connection ceased in 1865. In 1868 the exports totalled 8,000,000 lbs,

The first private company to be formed was the Assam Company in 1839 with a capital of £500,000, which purchased the Government plantations at Sibsagar in the following year. Tea was experimentally started in the Darjeeling District in 1840 and in the same year introduced into the Chittagong District. The first garden in Cachar was opened in 1855. The industry in the Tarai started in the year 1862 and in the Western Duars, where the climate and soil have proved extremely suitable for tea cultivation, twelve years later. The early years of tea planting were marked by many failures, and when in 1853 the tide turned there was such reckless extension of tea cultivation and speculation in gardens, that a severe crisis occurred in 1866. The elements of weakness were then eliminated and subsequently the history of the tea industry in the Presidency of Bengal has been one of almost uninterrupted prosperity. In Northern India tea has also been produced but on a small scale, in the United Provinces in the districts of Dehra Dun, Almora and Kumaon Garhwal, and in the Chota Nagpur District of Bihar and Orissa. In the Punjab it is to be found in the Kangra valley, the States of Mandi and Sirmur and to a very small extent in the Simla Hills.

Tea has also been profitably cultivated in Southern India since 1853, chiefly in the Wynaad, the Nilgiris, the Anamalais and the high range of Travancore, and the depreciation in coffee values has led in recent years to the conversion of considerable areas formerly under that plant into tea gardens.

The production of tea in Burma is insignificant, the area in 1914 being less than 3,000 acres and the tea grown, as in the neighbouring Shan States, is chiefly used for making *letpet* or pickled tea which is eaten as a condiment and not drunk as a decoction.

Most of the more important gardens in north-east India are managed and financed by Calcutta agency firms, but in Southern India while agents are not unknown, the majority of estates are privately owned. Every garden of any importance has its own factory where tea is prepared for the market, as it is essential that the various processes should be carried through immediately after the leaf has been plucked. The better organised factories are elaborately equipped with highly specialised plant and are under the supervision of expert tea makers.

Ceylon tea.

When the coffee industry collapsed, Ceylon turned to tea. In 1875 the exports of tea from that island amounted to 784 lbs. valued at £180. Twenty years later the total was 110,095,000 lbs. valued at £3,075,000 and Ceylon is now India's most dangerous rival. Exports in 1915 reached the high figure of 215 million lbs. and in 1916 203 millions. In 1918 the total was 181 million lbs. owing to shortage of freight and reduced exports to the United States, Canada and Russia. It is a matter of surprise that Ceylon should be finding a new market for her lower grade teas in India, the total imports in 1918 being 8½ million lbs., of which, however, 905,000 lbs. were for blending in Calcutta, and reshipment to South America.

The following table shews the area under tea in each province and the production in lbs. in the calendar year 1918.

Acreage and production.

TABLE No. 118.—*Area and production in tea according to provinces in 1918.*

Provinces.	Area.	Production.
	Acres.	Lbs.
Assam	405,951	253,270,093
Bengal	169,108	89,983,561
Travancore	44,458	22,629,250
Madras	38,528	10,518,373
United Provinces	7,987	2,234,760
Punjab	7,508	1,388,729
Burma	2,815	110,345*
Bihar and Orissa	2,178	323,864
TOTAL	678,533	380,458,975

* Converted at the rate of 4 lbs. *letpet*=1 lb. black tea.

Evidence of the prosperity enjoyed by the tea industry during the war is furnished by the extension of gardens in the chief tea-producing districts. In Assam the area under tea has increased since 1914 by 30,000 acres, in Bengal and Madras by over 10,000 and in Travancore by 6,000.

Tea cultivation postulates a warm, sub-tropical humid climate, and a well-distributed rainfall of not less than 60 inches annually. In India the tea plant is raised not from cuttings or layers but from seed, and the bushes which are about three feet high and trained to give a good spread of plucking surface are in full bearing by the sixth or eighth year. The average yield from Indian tea gardens has considerably increased in the last thirty years from less than 300 to 600 lbs. per acre. It is higher in Assam than elsewhere, but the yields there do not normally exceed 800 lbs. while over 1,000 lbs. per acre have been obtained in Ceylon and Java.

Black tea.

The manufacture of black tea consists of five processes, which the perfection of machinery has made almost automatic—withering, rolling, fermenting, firing and sorting, while green tea is unfermented, *i.e.*, unoxidized. Every tea estate or group of estates has a factory attached to it where suitable machinery is installed. After firing, the leaf is graded, the principal grades of commercial tea being Flowery or Broken Orange Pekoe, Orange Pekoe, Broken Pekoe, Pekoe, Pekoe Souchong, Fannings and Dust. These names are derived from China. When only the bud and the two young leaves are taken, Flowery Orange Pekoe is the bud, Orange Pekoe, the tenderer leaf and Pekoe the second leaf. Pekoe Souchong is from a third leaf when a bush is medium plucked and coarse pluckings yield inferior teas known as Souchongs and

Congous. But the commercial names have no longer any relationship to particular leaves. The broken leaf of each grade generally yields a stronger tea than the grade itself and consequently commands higher prices. The bulk of the tea produced in India is black tea.

Green tea.

During 1917 only 2·23 million lbs. of green tea were manufactured in British India. It is not necessary to comment at length on the stages of manufacture beyond stating that the object is to prevent the possibility of fermentation. Rather less than half the green tea produced in India in 1917 came from the Kangra Valley (Punjab), and the bulk of the balance from the Nilgiris and Chota Nagpur. The principal leaf grades are Young Hyson, corresponding to Orange Pekoe, Hyson No. 1 to Pekoe, Hyson No. 2 to Pekoe Souchong, Gunpowder, Twankay, Fannings and Dust.

Brick tea.

Small quantities of brick tea are made in the Darjeeling and Kumaon divisions for the Tibetan and Bhutan markets, but practically the trade has no commercial value. On the other hand, the brick tea trade of China has initiated a large trade in 'dust' tea to the Chinese ports of Hankow and Shanghai where it is manufactured into brick tea for the Russian market. In the past three years ending with 1916-17 the export figures have been 8·30, 9·85 and 9·29 million lbs. respectively. No Oolong tea has been made in India.

Labour.

As regards the labour force employed on the tea gardens, Mr. Shirras' most recent report on the production of tea in India gives the total as 752,500 in 1917, 654,900 being permanently and 97,600 temporarily employed. The figures are not quite complete as on some estates in Southern India work is done on contract and no record of the labour employed is available. Of the permanent employees contributing to the total above given, 471,270 are in Assam tea gardens and 107,000 in Bengal. The question of labour is one of much difficulty. Speaking generally, all the important districts have to obtain their labour from considerable distances, and this involves a heavy outlay and an elaborate machinery to control recruitment. Assam has always had to contend with special difficulties in view of its remoteness from the recruiting districts in the United Provinces, the Central Provinces, Bihar and Orissa and on the East Coast. The Assam Labour and Emigration (Amendment) Act of 1915 made important changes in recruitment of labour for Assam which is regulated by the Assam Labour and Emigration Act, 1901 (VI of 1901). Recruiting by contractors has been abolished and an Assam Labour Board formed for supervision of recruiting by local agents and garden *sirdars*. In 1916 the Government of India passed an Act for the conserving of man power, by prohibiting all labour emigration from the country.

Transport and shipping.

The transport of tea from the garden to the port of shipment was in the earlier days of the industry a tedious and expensive matter. The Darjeeling District was without a good cart road until 1869 and until the railway link

between Siliguri and the Ganges was completed in 1878, a long journey had to be accomplished to the Ganges by country cart. But now Darjeeling tea has only to be brought from the estate to the nearest railway station when it can be railed direct to Calcutta, while the Assam Bengal Railway brings part of the produce of Assam direct to Chittagong and part is borne on the broad waters of the Brahmaputra into Calcutta by an excellent service of cargo steamers. On arrival in Calcutta, tea is warehoused at Kidderpore, where, if for auction, it is stored, bulked if necessary, lotted, sold and eventually shipped. In Southern India the position has also improved in recent years and will be even better if the projected railway from Manantoddy (in the Wynaad) to the coast is built.

Tea seed.

India has been an exporter of tea seed for some considerable number of years past and has been the means of supplying other producing countries with a superior type of plant. Figures are available from 1895-96 but the trade shows marked fluctuations. In that year exports aggregated 3,238 cwts. and in 1897-98, 5,371 cwts. but only 601 cwts. were shipped in 1902-03. The table below shews that the trade which had more than recovered by 1912-13 has since been greatly affected by war conditions.

TABLE NO. 119.—*Exports of tea seed from India from 1912-13 onwards.*

Year.	Quantity.	REMARKS.
	Cwts.	
1912-13	13,338	Chiefly to Java, Ceylon and Sumatra.
1913-14	7,847	,, ,,
1914-15	4,384	,, Sumatra and Ceylon.
1915-16	2,755	,, Ceylon and Sumatra.
1916-17	2,757	,, ,,
1917-18	2,338	Chiefly to Sumatra, Java, and Ceylon
1918-19	1,268	,, ,,

Shipments to Java in the two years prior to the outbreak of war were peculiarly heavy. In the last ten years very considerable extensions have been made of the area under tea in the Dutch East Indies, to a large extent with British capital.

Month of shipment.

In a normal trade year the principal months for tea shipments are from July to December inclusive ; but appreciable quantities also go forward in June, January and February. The curtailment of shipping facilities owing to tonnage scarcity altered all this, and even after the export trade in tea was controlled and the total volume of shipments approximated once more to

pre-war levels, the seasonal distribution of exports ceased to be so clearly defined.

Exports and ports of shipment.

In no year have the exports of tea from British India been so great as in 1917-18 when 359·17 million lbs. were sent away, but the value £11,782,000 was less than that of the exports in 1915-16, *viz.*, £13,320,000. In 1916-17 the trade amounted to 291·4 million lbs. valued at £11,181,000 partly due to a smaller production and partly to a scarcity of shipping facilities. Early in 1917 it became necessary, owing to the reservation of freight for articles of the first importance, to restrict the export of tea from India to the United Kingdom, the space which the Shipping Controller undertook to provide being sufficient only for about one-third of the total exports of the previous year, including purchases on account of the War Office. As a considerable balance of the 1916-17 crop was still unshipped, prospects were gloomy, but in November 1917, the Food Controller formulated a scheme for the purchase and shipment of 40 per cent. of the Indian tea crop between November 1st, 1917 and May 31st, 1918, which was operated through a Tea Commissioner in Calcutta. So successful was this scheme that the Food Controller raised his requirements by another 25 million lbs. and ultimately took all the tea that offered to fill the available tonnage. The percentage of tea shipped to the United Kingdom was 74, as compared with 77 in the previous year, and the feature of the trade in 1917-18 was the increase in direct shipments to the United States of America where considerable quantities of Java tea had been dumped in the previous year. If prohibition becomes effective throughout the Republic, there is almost certain to be a very largely enhanced demand for tea from this quarter in which Indian shippers may hope to participate. America took 23,000,000 lbs. more British grown tea in 1917 than in 1916. Next to the United Kingdom, Russia before the war was India's best customer for tea and she continued to be so until the latter part of the 1917 season, when Russian buyers practically disappeared from the Calcutta market. However, the embargo placed by the Commonwealth Government on the import into Australia of China and Java teas encouraged larger purchases from India as well as Ceylon. Unfortunately early in 1918 this embargo had temporarily to be raised, as freights were so scarce from Calcutta and Colombo that a shortage of stocks in Australia was apprehended. The embargo has again been imposed with effect from September 1918. Persian buyers were also strongly in evidence in 1917, and if the difficulty of transport had been less acute would probably have taken even more than they did. Shipments from Calcutta increased by over 38 per cent. while those from Chittagong were 25 per cent. in defect as compared with the figures for 1916-17. In the following year the Tea Commissioner took 66 per cent. of the 1918 crop including purchases on War Office account and the balance shippers were left to dispose of themselves. Upon the conclusion of the armistice private consignments of tea became once more unrestricted. It is not without interest to note the great expansion in exports in recent years, in particular to the United Kingdom.

TABLE No. 120.—*Exports of tea from India in 1890-91 and every fifth year thereafter up to 1910-11, and for each of the last six years and the share of the United Kingdom therein.*

Year.	Grand total of exports.		Exports to the United Kingdom.	
	Quantity.	Value.	Quantity.	Value.
	Lbs.	£	Lbs.	£
1890-91	107,014,993	3,479,489	100,208,625	3,284,144
1895-96	137,710,205	5,109,925	123,947,369	4,625,452
1900-01	190,305,490	6,367,286	166,171,556	1,768,524
1905-06	214,223,788	5,898,402	166,591,433	4,593,454
1910-11	254,301,089	8,276,912	182,935,424	5,982,589
1913-14	289,473,591	9,983,372	209,050,771	7,232,049
1914-15	300,733,434	10,352,329	237,303,792	8,162,231
1915-16	338,470,262	13,320,715	250,290,291	9,800,735
1916-17	291,402,608	11,180,649	224,927,894	8,671,266
1917-18	359,174,232	11,781,746	266,963,516	8,535,000
1918-19	323,659,710	11,850,404	282,205,196	9,859,050

Supplementary to the above figures details shewing the distribution of re-exports from the United Kingdom to other countries are subjoined. The figures for 1918 are not yet available.

TABLE No. 121.—*Quantity of Indian tea re-exported from the United Kingdom to principal foreign countries, in the years 1913 to 1917.*

Countries.	1913.	1914	1915.	1916.	1917.
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
Re-exported to—					
Russia . .	6,979,883	1,777,630	2,211,099	3,822,377	166,589
Denmark . .	269,372	2,014,303	4,753,450	1,666,260	75,060
Germany . .	764,954	476,073	...	...	...
Holland . .	2,026,331	12,325,173	3,425,862	849,024	26,840
Belgium . .	115,575	89,108	54	69	499
France . .	124,649	670,775	985,260	611,861	264,415
Austria-Hungary	259,119	156,585	...	...	...
Turkey—European.	81,954	39,170	...	...	...
Turkey—Asiatic	170,992	96,190	...	...	...
Portuguese East Africa.	184,743	167,363	87,692	51,767	10,092
United States of America.	2,175,972	3,015,805	2,655,876	4,700,742	541,740
Canada . .	2,262,313	4,279,394	4,431,973	3,313,622	873,221
Chile . .	1,393,651	880,125	839,997	1,993,813	265,251
Argentine Republic.	955,949	726,917	883,540	1,141,024	133,891
Channel Islands.	792,082	690,946	828,444	870,903	434,968
Union of South Africa.	1,593,440	1,387,246	1,338,694	712,713	10,559
Newfoundland	71,330	44,397	49,352	78,574	11,036
Other Countries.	1,607,665	1,562,036	2,049,473	5,507,255	466,443
TOTAL RE-EXPORTED	21,829,974	30,399,236	24,540,766	25,319,944	3,280,604

The unusually heavy exports to Holland in 1914 and 1915, though greatly in excess of the normal demand from Germany, are believed to have found their way into that country.

There are shipments of tea from all the principal ports but 90 per cent. of the trade go from Calcutta and Chittagong, while Tuticorin, Cochin and Calicut account for 7 per cent. of the remainder. No tea is grown in the Bombay Presidency and the increased shipments from Bombay during the war are to be ascribed to freight being made available at that port. For the South American market which prefers a blend of Ceylon and Indian teas, arrangements were come to in 1917 permitting blending in bond in Calcutta under Customs supervision. Exports to South America which totalled 2,021,000 lbs. in 1917-18 swelled to 4,800,000 lbs. in 1918-19.

TABLE No. 122.—*Share of the provinces during the last five years in the export of tea from India.*

Ports.	1914-15.	1915-16.	1916-17.	1917-18.	1918-19.
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
Bengal (Calcutta and Chittagong).	274,657,148	301,402,632	262,692,880	324,828,518	279,755,290
Bombay (Bombay)	4,039,149	11,195,037	3,721,750	9,054,340	14,296,986
Sind (Karachi) .	38,318	26,767	45,659	393,045	2,539,053
Madras (Tuticorin Cochin, Calicut.)	21,995,462	25,839,766	24,907,996	24,894,951	27,067,441
Burma (Rangoon)	3,357	6,060	34,323	3,378	940
TOTAL .	300,733,434	338,470,262	291,402,608	359,174,232	323,659,710

The distribution of the export trade between Calcutta and Chittagong is not without interest. In the last pre-war year the ratio was in the neighbourhood of 5 to 1 and, contrary perhaps to assumptions based upon greater opportunities of freight in Calcutta, the smaller port has, except in 1917-18, increased its share of the business during the years of war.

TABLE No. 123.—*Shipments of tea from Calcutta and Chittagong from 1914-15 onwards.*

Ports.	1914-15.	1915-16.	1916-17.	1917-18.	1918-19.
	Million lbs.	Million lbs..	Million lbs.	Million lbs.	Million lbs.
Calcutta . .	226·73	248·29	201·79	279·23	225·00
Chittagong .	47·92	53·11	60·90	45·58	54·75

Transfrontier trade.

The trade in tea across the land frontiers of India, excluding the imports of *letpet* and some black tea from the Shan States which are really a part of Burma, is confined to brick tea entering India *viâ* Tibet and Nepal and Indian and foreign teas going chiefly to Afghanistan.

TABLE No. 124.—*Imports and exports of tea across the land frontiers of India.*

Year.	Imports excluding *letpet*.	Exports.
	Lbs.	Lbs.
1908-09	3,137,120	1,541,568
1914-15	4,319,392	2,431,296
1915-16	5,734,624	2,550,464
1916-17	6,102,768	1,839,936
1917-18	5,463,248	2,102,464
1918-19	5,902,960	3,749,088

Unit of sale and shipment.

The unit of sale is uniformly the lb. *c. i. f.* for London and *f. o. b.* for America. The unit of shipment is the chest which varies in weight from approximately 80 to 120 lbs. nett according to the fineness or coarseness of the quality packed. Fannings and dust would approach more nearly to the maximum weight while Souchong owing to the size and coarseness of its leaf would turn the scale at nearer the lower weight.

Prices.

Shipments of tea from India fall into two classes : (*a*) consignments direct from the garden to London where they are sold by auction in Mincing Lane : (*b*) consignments sold at auction in Calcutta and shipped thence chiefly to what are known as ' outside ' destinations, *i.e.*, countries other than the United Kingdom. The Calcutta tea auctions in pre-war times used to commence in May and continued weekly until January or February in the following year. In the last six years for which figures are available, the following are the details according to districts of sales at Calcutta.

TABLE No. 125.—*Quantity of tea (in packages) sold at the auction sales in Calcutta in the years 1913-14 to 1918-19.*

Principal districts.	NUMBER OF PACKAGES SOLD IN					
	1913-14.	1914-15.	1915-16.	1916-17.	1917-18.	1918-19.
Assam . .	209,686	192,031	285,771	327,124	309,098	267,816
Cachar . .	133,540	106,863	137,061	137,033	91,404	66,334
Sylhet . .	116,197	95,835	122,880	128,233	87,449	73,941
Duars . .	240,169	163,951	269,670	272,244	134,782	127,848
Darjeeling . .	85,877	71,574	103,237	99,266	59,324	34,605
Chittagong .	9,647	5,839	9,792	8,428	5,215	3,924
Terai . .	36,709	33,327	39,006	41,935	31,006	16,775
Chota Nagpur .	1,387	900	1,725	210	7	13
Kumaon and Kangra.	2,089	1,513	2,586	788	140	158
Dehra Dun .	9,217	5,485	5,821	2,633	244	1,831
Madras . .	578	232	124	1,090	4,855	142
Nepal . .	1,069	...	872	900	437	434
Other places .	974	250	...	...	91	765
TOTAL .	847,079	677,800	978,545	1,019,884	724,052	594,586
AVERAGE PRICE PER LB.	7 *as.* 9 *p.* ($7\frac{3}{4}d$).	7 *as.* 7 *p.* ($7\frac{7}{12}d.$)	8 *as.* 11 *p.* ($8\frac{11}{12}d.$)	8 *as.* 8 *p.* ($8\frac{2}{3}d.$)	7 *as.* 3 *p.* ($7\frac{1}{4}d.$)	8 *as.* 0 *p.* (8 *d.*)

TABLE No. 126.—*Quantity (in packages) and average price per lb. of Indian tea sold in London from 1913-14 onwards.*

Year.	No. of packages sold.	Average price per pound.
		d.
1913-14	1,791,451	9·25
1914-15	1,819,261	9·85
1915-16	1,710,938	10·62
1916-17	1,391,275	12·57

Export duty.

Exports of tea have for the last fifteen years been subject to a cess of ¼ pie ($\frac{1}{48}$*d.*) per lb. imposed by the Indian Tea Cess Act (Act XX of 1903), which was introduced at the request of the Indian Tea Association to furnish funds, to advertise and stimulate the tea drinking habit, and by the appointment of agents in India and abroad to push the sales of Indian grown tea. Government acts in the matter purely as a revenue collecting agency, and all moneys received are placed in the hands of a non-official committee to administer. The total amount collected in 1917-18 was £31,130 of which £5,000 was allotted for propaganda in the United States Army, and £23,000 for work in India. In addition to the cess, all tea exported from India has since the 1st March 1916 been subject to a duty of Re. 1-8-0 per 100 lbs. equivalent to about ¼*d.* a lb. In 1918-19 this duty yielded £285,313.

Consumption of tea in India.

A considerable amount of black tea is consumed in India itself, and Burma absorbs annually about 18 million lbs., of pickled tea (*letpet*) which is grown chiefly beyond her borders in the Northern Shan States.

TABLE No. 127.—*Quantity of tea, green and black, available for consumption in India during the years 1913-14 to 1918-19.*

Year.	Production.	Deduct net exports to foreign countries.	Add stocks from previous year.	Deduct stocks left at end of year.	Balance available for consumption.
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
1913-14	307,249,669	284,452,905	†1,884,500	†2,418,100	22,263,164
1914-15	312,976,208	293,685,389	†2,418,100	†2,423,100	19,285,819
1915-16	371,836,668	330,524,880	†2,423,100	‡13,000,000	30,734,888
1916-17	368,428,719	283,325,842	‡13,000,000	§61,000,000	37,102,877
1917-18	371,296,338	346,588,167	§61,000,000	*43,500,000	42,208,171
1918-19	380,458,975	312,004,713	43,500,000	59,532,500	52,421,762

* Estimated stocks at Calcutta (Kidderpore) and Chittagong (Bombay and Madras being normal) also the amount held up at the gardens.

† Estimated stocks at Calcutta (normal elsewhere).

‡ Estimated stocks at Calcutta (Kidderpore) and Chittagong (normal elsewhere).

§ Estimated stocks at Calcutta (Kidderpore), Chittagong, Madras and Bombay and also the amount held up at the gardens.

If these figures are reasonably accurate, as they are believed to be, the annual consumption of Indian tea in India has increased by ten million lbs. in the last twelve months, and allowing for a percentage of error the total must be in the neighbourhood of fifty million lbs. as compared with about twenty millions at the outbreak of war. For this encouraging development of the home market the propaganda of the Cess Committee of the Indian Tea Association is chiefly responsible. There has been a marked increase in tea shops not only in Calcutta, Madras and other big cities but also in the smaller towns particularly in Southern India.

Imports of tea.

The imports of foreign tea, black and green, into India in 1918-19 (exclusive of those from the Shan States) amounted to 11 million lbs. valued at £592.727. Of this about 725,000 lbs. were for blending and re-export from Calcutta, while 1¾ million lbs. were re-exported from Bombay which has always served as an entrepôt for ports in the Persian Gulf, Arabia and East Africa, and ¾ million across the land frontiers. In the result the figure of net imports is 7¾ million lbs. India manufactures little green tea and 4 million lbs. were imported in 1918-19 chiefly from China to make good the deficiency in Northern India where it is preferred to black tea. The bulk of the black tea imported was low grade Ceylon, the increasing quantities of which absorbed on the Malabar Coast and the neighbouring districts are a matter of considerable concern to the tea planters of Southern India, though it is ascribed in part to causes which may be expected to disappear on the return of normal conditions.

Finance.

The capital of joint stock companies invested in tea in India in 1917 was approximately £22 millions chiefly in sterling companies.

When teas are purchased at the local Calcutta auctions, the firms draw for their value through a bank against shipping documents. In Calcutta teas are sold for cash 10 days after purchase. Some gardens sell the whole of their production in advance.

Tea waste.

Tea waste or refuse is the chief source commercially of caffeine. A considerable quantity of tea refuse is exported from India amounting in the three years 1914-15 to 1916-17 to 3·06, 3·71 and 3·61 million lbs. respectively. The bulk of it is shipped to the United States of America.

TABLE No. 128.—*Exports of tea waste from India from 1913-14 onwards.*

Year.	Quantity.	Value.
	Lbs.	£
1913-14	3,084,288	17,907
1914-15	3,065,828	18,118
1915-16	3,718,323	27,088
1916-17	3,616,944	41,621
1917-18	7,315,142	108,554
1918-19	1,641,320	26,368

Tea chests.

A number of Himalayan woods have at different times been used for making tea chests, particularly *toon* (*cedrela toona*) and *simal* (*bombax malabaricum*), but

certain varieties have the reputation of tainting the tea, and other require prolonged seasoning before they can be considered suitable. Burma tea shooks were largely employed for this purpose until the beginning of the present century, but by 1908-09 this trade had died out and the tendency since has been to rely more and more upon patent tea chests from Northern Europe. Steel chests were also experimented with at one time but proved too expensive for general adoption.

The import trade in wooden tea chests rose in value from £233,000 in 1908-09 to £298,000 in 1911-12 of which 95 per cent. came from the United Kingdom though made largely of Russian birch and alder. During the war, until the Russian Revolution cut off communications by the Trans-Siberian Railway, large shipments of shooks were made *viâ* Vladivostok, instead of as previously *viâ* the United Kingdom. The value has fluctuated from year to year but with an upward tendency and at the outbreak of war had stood at £347,000 : in 1915-16 £545,000 and in 1916-17 as a result of great appreciation in prices, £579,000. The figures for 1917-18 and 1918-19 were £628,000 and £606,500 respectively.

The value of metal chests imported in the last pre-war year was only £2,137 and in 1918-19 £173.

The chests, to save space and freight, are shipped in the form of shooks, cut to size, with clamps, etc., which are made up locally and lined with thin sheet lead. After filling they are carefully soldered and made air-tight so that the tea will not absorb moisture and become mouldy.

HIDES AND SKINS.

The term *hides* in general parlance denotes the raw, dressed or tanned skins of bullocks, cows, buffaloes, horses, camels, etc., while the term *skins* is restricted to those of calves, sheep, goats, deer and other wild animals. Statistically and commercially, however, calf skins are treated as hides. It has been calculated that in India there are about 180 million head of cattle and 87 million sheep and goats.* The internal trade in hides is greatly affected by the seasons, and, when there is any shortage of fodder or general scarcity the market is unusually brisk. Before the war the exports of raw hides and skins largely exceeded the tanned as the following figures for 1913-14 indicate.

TABLE NO. 129.—*Quantity and value of hides and skins exported in 1913-14.*

Descriptions.	Hides.		Skins.	
	Quantity.	Value.	Quantity.	Value.
	Cwts.	£	Cwts.	£.
Raw	1,115,747	5,530,000	486,563	2,260,000
Tanned	174,028	1,058,000	130,593	1,758,000

It has been estimated that the internal absorption of tanned hides and skins in local manufactures was equal to the entire volume exported

* Report of Indian Industrial Commission, Appendix D.

making the total turn-over in hides and skins about £13 millions annually. In round figures out of every 100 hides exported, only seventeen were exported tanned, and of every 100 skins only twenty.

Raw hides.

In the two years preceding the outbreak of war, there was a marked advance in the prices of dry and salted hides due to a world shortage and an increased demand. This advance was particularly marked in the case of buffalo hides, which appreciated by 50 per cent. between 1912 and 1913. There is evidence in fact of considerable overtrading (doubtless deliberate) on the part of Germany and Austria with a consequent accumulation of stocks in Europe, while the United States market was almost bare. In 1913-14 the distribution of the exports of raw hides was as indicated in the table below.

TABLE No. 130.—*Distribution of exports of raw hides in 1913-14.*

Destinations.	Quantity.	Percentage.	Value.
	Cwts.		£.
Germany	388,000	35	2,044,000
Austria	238,000	21	1,229,000
United States of America	155,000	14	698,000
Italy	107,000	10	563,000
Spain	49,000	5	296,000
United Kingdom	42,000	3	166,000
Holland	41,000	3·5	197,000

The declaration of hostilities caused in the first instance an accumulation of stocks in Calcutta, Agra, Cawnpore and other hide collecting centres in Northern India enabling Madras tanners to buy at reasonable prices the finer qualities of raw hides previously shipped to the German and Austrian markets. Madras tanners purchased freely and sent large consignments of tanned 'kips' to the United Kingdom where unfortunately the market again became congested as there were not enough curriers available to work them up into commercial leather. Gradually however, the capacity of the English tanneries has been extended to deal with the increased supplies of raw hides from India, and since the Indian Munitions Board took over the control of export in June 1917, fresh openings have been found in Italy and the United States of America, in spite of the difficulties of freight and finance, for considerable quantities of raw hides which formerly used to go to the Central Powers. These stages are illustrated in the table given below. The figures for 1918-19 are: United Kingdom 217,752 cwts. (57 per cent.), Italy 100,778 cwts. (26 per cent.), United States 41,456 cwts. (10 per cent.), and other countries 21,961 cwts. (7 per cent.).

TABLE No. 131.—*Percentage share of the various importing countries of raw hides * from 1914-15 onwards.*

Destinations.	1914-15.	Percentage.	1915-16.	Percentage.	1916-17.	Percentage.	1917-18.	Percentage.
	Cwts.		Cwts.		Cwts.		Cwts.	
United States of America	187,173	27	312,965	35	461,167	51	78,123	18
Germany	146.575	20	..	..	..	..	..	..
United Kingdom . .	132,322	18	99,290	11	145,140	16	176,847	42
Italy	72,199	10	383,360	43	172,871	19	156,231	37
Austria	60,143	8	..	..	..	..	..	..
Spain	47.011	7	29,552	3	41,317	5	..	..
Holland	5.518	·08	..	..	..	..	..	..

* Including calf-skins.

Exports.

The following table indicates the total volume of the export trade from 1913-14 onwards with the distribution under different heads.

TABLE No. 132.—*Total volume of the exports of raw hides from 1913-14 onwards classified according to descriptions.*

Year.	Cow hides.	Buffalo hides.	Calf-skins.	* Total Quantity.	Total Value.
	Cwts.	Cwts.	Cwts.	Cwts.	£
1913-14 . .	743,037	345,864	26,116	1,115,747	5,530,638
1914-15 . .	480,513	211,745	21,158	713,926	3,500,693
1915-16 . .	689,113	162,887	29,761	881,885	4,523,590
1916-17 . .	581,645	261,099	50,933	894,028	4,994,675
1917-18 . .	317,588	84,900	15,415	417,903	2,059,092
1918-19 . .	283.994	78,984	18,969	381,947	1,742,736

The totals under the head cow hides are inflated somewhat by the shipment of large calf-skins under that head, because they obtain better prices under the former designation.

In 1916-17 there was a marked advance in prices and owing to export restrictions, shipments to the United States of America were confined to buffalo hides, and reduced quantities of cow hides went to Italy. In 1917-18 freight was difficult to procure and rates sagged again and the total quantity of raw hides exported was only slightly in excess of the quantity of tanned hides. In 1918-19 there was a further fall due, in part, to the restrictions brought into force towards the close of the previous year being made stricter, and values were again lower than in the previous year. The distribution of the trade in normal times is contrasted below with that of 1918-19.

TABLE No. 133.—*Quantity and percentage share of the various ports in the export of raw hides in 1913-14 and 1918-19.*

PORTS.	1913-14.		1918-19	
	Quantity.	Percentage.	Quantity.	Percentage.
	Cwts.		Cwts.	
Calcutta	872,341	78·1	195,006	51·0
Rangoon	143,159	12·8	76,478	19·8
Karachi	79,669	7·2	97,618	25·6
Bombay	16,738	1·5	12,611	3·3
Madras	3,840	·3	234	·2

During the war Karachi has captured part of the Calcutta pre-war trade, notably in the cases of *daissie* and *dakkin* classes from the United Provinces.

Trade organisation.

Indian hides vary a good deal in size according to the breed of cattle and province of origin. Large numbers are depreciated in value owing to the owners of the animals from which they have been taken having wantonly branded them. The pelts of those used for draught purposes or allowed to die of old age or starvation are also deteriorated. Indeed it may be said that improvements in the general quality of the hides marketed have scarcely kept pace with developments in the organisation of agencies for collecting them which have been stimulated by higher prices in recent years for the raw material.

Hides are collected upcountry from slaughter houses or cultivators by *beparis* who consign them to *arathdars* in the big markets such as Cawnpore, Lahore and Calcutta. These *arathdars* are the large dealers in the bazaar who finance the upcountry *beparis* and eventually sell the hides to the large European and Indian exporting houses and to the tanneries. Endeavours are being made by Government to teach the upcountry collectors of hides better flaying and cleaner curing, for the primitive methods generally employed are at present a great handicap to the trade. The Calcutta raw hide trade was when war broke out in the hands of a German ring, but a number of prominent British firms have since been persuaded to interest themselves in this market and it is hoped that all enemy taint has now been removed. The share of Madras in the export of raw hides has always been inconsiderable, the average exports from Southern India for the five years ending 1912-13 being only 1,207 cwts.

The German trade covered not only the 'kills' and finer qualities of hides but also 'commons' and badly cured 'dead' hides, for which there was also a market in Austria-Hungary, Italy and Spain.

Descriptions.

Three principal descriptions of hides are recognised, cow hides, buffalo hides, and calf-skins. Hides after being flayed are cured either for transport by rail or for shipment to other countries by three methods :

(*i*) wet salting.
(*ii*) dry salting.
(*iii*) air-drying and arsenication.

Hides are scarcely ever shipped wet-salted but are preserved in this way for local transport by rail to tanneries.

Dry salted hides receive a number of applications of a solution of salt and water which is eventually left to dry on the hides, the salt used being generally *khari* (*i.e.*, sodium sulphate). This method of cure has encouraged adulteration in certain markets, extraneous matter in the form of mud, lime, etc., being plastered on the hides to give them additional weight ; but the Calcutta Hides and Skins Shippers' Association has been giving a great deal of attention to this matter recently and it is hoped that improvement will soon be noticeable.

Hides are air-dried in the drier parts of India, the finest qualities being stretched on frames and known in the trade as 'framed' hides Before exporting, air-dried hides are always arsenicated, *i.e.*, treated with a solution of arsenic and water at the port of shipment. In the rainy season when sun-drying is impossible, a salt lotion is applied in lieu. The chief varieties of dry salted hides known to the trade are *Daccas, Meherpurs, Dinajpurs, Rangpurs,* and *daisies* and of arsenicated, *Agras, North-Westerns, Darbhangas, Purneas, Ranchis, Patnas, Sambalpurs,* etc., the first two grades being frame-stretched hides superior in quality. *Patnas* are divided into *crumpled* and *uncrumpled,* the former being low grade hides the appearance of which has been spoilt by careless drying after flaying. For export, hides are again classified as *slaughtereds, deads, rejections* and *double rejections.* The hides of animals which are slaughtered fetch better prices than those which die a natural death and they are distinguished commercially by the terms 'kills' and 'commons.' All hides classified as 'slaughtered' and 'kills' are not necessarily from slaughtered animals but may be dead hides sufficiently fine in quality and condition to warrant the description. It should be noted that only a very small percentage of Indian raw hides are from animals actually killed and slaughtered, these being principally from the Municipal slaughter-houses in the large cities and the army slaughter-houses at the big military centres and also from Saugor, Agra and other towns in the United Provinces and Bihar where cows are killed for the 'jerked' meat trade with Burma.

The very finest types of slaughtered hides are known as 'Commissariats,' a designation due to the fact that for many years the Indian Government purchased large quantities of cattle to supply the British troops with beef, the hides of which were branded with the letter 'C'. The Indian Government no longer buys cattle but the term still stands for the best quality of slaughtered hides.

Unit of sale and shipment.

In Calcutta raw hides are usually sold in the bazaar at prices per unit of 20 lbs, though some buyers prefer to purchase per *corge* of twenty pieces. The export houses always quote per ℔ *c. i. f.* or *c. f.* The unit of shipment for cow hides is the bale containing 100 to 200 pieces,* for buffalo hides 40 to 50 pieces, and for calf-skins 500 pieces. In Bombay the unit of sale is the ℔ but in Karachi as in the Punjab and United Provinces the maund of 28 lbs., shipment being made from the former port in bales containing 1,000 to 1,200 lbs. nett and from the latter in bales of 1,150 to 1,200 lbs. gross. The unit of sale in Rangoon is the lb.

Tanned hides.

Half tanned or 'crust' tanned hides known in the trade as East India 'kips,' the product for the most part of Indian hand-tanneries in Madras and Bombay were in pre-war days exported in considerable quantities to the United Kingdom where they were curried and turned into finished

* In the case of hides weighing less than 4 lbs apiece, 300.

leather. The tannage used was chiefly the bark of *cassia auriculata*, (known as *avaram* in the Madras Presidency and *tarwad* in Bombay) of which there are abundant supplies only in the two presidencies named and in the adjoining Native States of Hyderabad and Mysore.

Government control.

As soon as the value of these hides as upper leather for army boots was realized, every effort was made to stimulate the export, and in August 1916 the Government of India assumed control of the trade and purchased the whole supply for shipment direct to the War Office. The scale of prices was revised from time to time, but so pitched as to encourage the production of army selection leather as much as possible. Steps were also taken to prevent adulteration and improper weighting. The average outturn before the war was only 1,500,000 'kips' annually equivalent to 27,000,000 feet of upper leather. The output at one time during the war was in the neighbourhood of three million 'kips' and at least three-fifths of the upper leather used for the Allied Army boots was made from Indian hides. The statement below shews the development of the trade since the outbreak of war, though the figures are weighted with a small proportion of tanned buffalo hides and calf-skins which formed part of the Government purchase scheme.

TABLE No. 134.—*Exports of tanned hides contrasted in pre-war and war years.*

Year.	Quantity shipped in cwts.	Value in £
Pre-war years—		
1913	194,763	1,166,720
1914	187,702	1,322,758
War years—		
1914-15	217,020	1,606,649
1915-16	272,002	2,041,582
1916-17	323,676	2,995,561
1917-18	365,145	3,269,595
1918-19	309,110	4,744,979

The figures for 1917-18 would have been very much higher had more freight been available, for, on the 31st March 1918 there were no less than 67,000 cwts. valued at £666,000 approximately, awaiting export and shipments in 1918-19 therefore registered an advance of 40 per cent. over those of the previous twelve months. If the 1913-14 figures are represented by the index number 100, the 1918-19 figures indicate an increase of 162 per cent. in quantity and 306 per cent. in value. The greater part of the output was from Madras tanneries and shipped from that port. Instead of eight or nine separate tannages formerly recognised, such as *Bangalores*, *Cocanadas*, etc., Madras tannages for War Office shipments were classified into four main grades, *primes*, *best*, *good*, and *ordinary*, each of the first three being again sub-divided into two classes,

according to growth and spread. In 1914-15, 74 per cent. of the exports went from Madras and in the following year more than 81 per cent. In 1915-16, a considerable quantity of Northern India hides, the export of which uncured was affected by restrictions on export, was railed down to Madras and tanned there. In 1916-17, 99 per cent. of the exports of tanned hides went to the United Kingdom which nearly doubled its import from [sic] India as compared with the pre-war average. The total shipments in the year increased by 18 per cent. as compared with 1915-16 and by 76 per cent. as compared [sic] with the pre-war average.

The unit of sale alike in Madras and in Bombay is the ℔ and shipment is made in bales of 500 lbs. nett from Bombay and in pressed, gunnied, roped bales each containing 600 to 675 lbs. from Madras. Quotations for export are based on the lb. *c.i.f.*

Raw skins.

India's exports of raw sheep and goat skins have greatly expanded during the last twenty years owing to the introduction of chrome leather tanning in the United States and the increased demand in Europe for glacé kid. Being largely obtained from animals slaughtered for food, Indian skins, and goat skins in particular, compare more favourably than Indian hides with similar classes of pelt from other parts of the world. The condition of the trade in the last pre-war year and subsequently is illustrated by the following table.

TABLE No. 135.—*Exports of raw skins from India from 1913-14 onwards.*

Year.	Quantity in cwts.			Total.		Average value per cwt.
	Goat skins.	Sheepskins.	Others.	Quantity. cwts.	Value £.	£
1913-14	453,356	33,067	140	486,563	2,260.244	4·6
1914-15	382,060	26,295	93	408,448	1,695.583	4·3
1915-16	399,951	32,517	229	432,697	1,995.184	4·6
1916-17	522,895	45,418	104	568.313	4,610.893	8·1
1917-18	403,537	39,117	523	429,028	3,295.321	7·4
1918-19	426,905	72,456	295	499.656	4,481,107	8·9

The export of goat skins, raw and tanned, from India represents about one-third of the world's supply. The United States of America has always been India's best customer for raw skins, her share of the trade often exceeding 75 per cent. of the total exports. Next came the United Kingdom, while Continental countries like France, Holland, Germany and Belgium which differentiated against tanned skins by their tariffs, absorbed considerable quantities. The fall in the quantity exported in the first two years of the war was of no great moment, and in 1916-17 there was a marked increase in the volume and an even more marked increase in the value of the skins which left India, although by a notification of the 12th August 1916 the only destinations to which shipments were permitted were the United Kingdom, the United States, France and

Italy. When an apprehended shortage of tanning materials and particularly of *tarwad* seemed likely to prejudice the output of East India 'kips' for the War Office, the tanning of sheep and goat skins in the Madras and Bombay Presidencies was prohibited with effect from the 28th April 1917 and this was followed up by an embargo upon the export of tanned skins to all destinations with effect from the 15th May. This measure might have been expected to have induced a considerable increase in the quantities of raw skins shipped, but in 1917-18 freight to America was scarce and the levels of the previous year were not maintained. The revival in 1918-19 was due to the removal of prohibitions on the import of raw skins into the United Kingdom and the United States of America. The bulk of the shipments of raw skins are made from the Bombay Presidency though shipments from Calcutta are individually greater. The distribution in normal times is shewn in the following table.

TABLE No. 136.—*Quantity and percentage share of the various ports in the exports of raw skins from India in 1913-14.*

Ports.		Quantity.	Percentage.	
		Cwts.		
Bombay	Bombay Presidency	137,559	51·5	28·3
Karachi		113,622		23·2
Calcutta		206,943		42·3
Madras		27,809		5·0
Rangoon		505		·4

Goat and sheep skins are either dry-salted with Glauber's salt (*khari*), wet-salted with common salt, or if purchased air-dried, arsenicated by dipping in a solution of arsenic and water. Indian goat skins are generally larger, heavier and of better texture than sheep skins. The best qualities of dry-salted goat skins sold in the Calcutta market are *Daccas, Kushtias, Dinajpurs* and *Muzaffarpurs* all of which are very suitable for the production of glacé kid. Other classes are *Darbhangas, Patnas, daisies* and *Chourichauras* the last of which are indifferent and command poor prices. *North-Westerns*, the principal centres for which are Cawnpore and Delhi, are generally wet-salted and run to a very much larger size than skins from Bengal and Bihar. The hair is coarser and the pelt thinner. *Amritsars* which are also dry-salted have a good spread. From Hyderabad and the Deccan strong medium size skins, are obtainable which are mostly sent to the tanneries in Southern India where they are cured for export, but are also shipped untanned from Bombay. The export of goat skins is much larger than that of sheep skins which come mainly from the Darbhanga district of Bihar and Orissa and from Rajputana. In Madras the skins are mostly dry-salted with the hair on, but sometimes flint-dried and very occasionally are wet-salted in the hair or unhaired and then pickled in a solution of alum and salt. These are then sorted according to substance of skin and condition into *firsts* and *seconds*,

the consignments usually consisting of definite proportions of each. The trade names of the best Madras skins are *Cocanadas*, *Bangalores*, *Mysores*, *Trichinopolys* and *Coimbatores*.

Unit of sale and shipment.

The unit of sale in Madras is a hundred skins and the unit of shipment is the pressed bale packed in mats and gunnies containing 756 lbs. nett or, in the case of salted and pickled skins, the cask. The lb is a recognised unit of sale in Bombay and Karachi, but in the latter market sales are also conducted on the basis of a score of 22 numbers. In Calcutta, on the other hand, skins are sold at the rate of 100 pieces and shipped in bales of 500 pieces, or casks containing 125 to 150, quotations for export being made per piece *c.i.f.* or *c.f.* High freights have discouraged shipment in casks and wet-salted skins are more frequently washed on arrival at the Calcutta depôts, treated with a fresh solution of salt, sun-dried and baled. Wet-salted skins are known in the American market as *soft stock* and dry-salted as *hard stock*. In Bombay the unit of shipment varies according to quality, dry skins being shipped in bales of 1,000 to 1,200 lbs. nett, sun-dried and salted skins in bales of 600 to 700 lbs. and wet-salted in casks of 560 lbs. In Karachi all raw skins are shipped in bales of 950 to 1,400 lbs. Each skin should be at least 21 inches wide if two sets of upper sides are to be obtained from it when it has been converted into glacé kid.*

Tanned skins.

Tanned skins, commercially speaking, mean sheep and goat skins only though there are some inconsiderable shipments of other pelts from Indian ports. As in the case of tanned hides, the existence of the bark of *cassia auriculata* in the Madras and Bombay Presidencies created a large industry in lightly tanned skins, which flourished for the first two-and-a-half years of the war with very high prices in England, the United States of America and Japan. The following table illustrates the volume of the trade, the great fall in 1917-18 being due to the embargo upon the export of tanned skins already referred to. This embargo was lifted only in September 1918, too late to effect more than a partial recovery in the figures for 1918-19.

TABLE No. 137.—*Exports of tanned skins from 1914-15 onwards with values and index numbers.*

Year.	Quantity exported.	Index number.	Value.	Index number.
	Cwts.		£	
1914-15	117,405	100	1,552,269	100
1915-16	127,322	109	1,699,177	109
1916-17	166,051	139	3,309,337	208
1917-18	34,186	31	904,390	63
1918-19	59,670	51	1,701,428	109

* Report of the Indian Industrial Commission, Appendix D.

The export of tanned goat skins greatly exceeds the export of tanned sheep skins, but not to the same extent as in the case of raw skins. The finest qualities of tanned sheep and goat skins come from the Trichinopoly and Coimbatore districts and the Dindigul sub-division of the Madura District of the Madras Presidency where the tanners are very expert and produce skins unexcelled as regards texture, colour and pliability. The finest qualities of Madras tanned skins are specially suitable for the production of light weight leathers finished in light colours. In other parts of the Madras Presidency and in Hyderabad there is a large outturn of tanned skins but they are much commoner in type. In pre-war days the chief importing countries were the United Kingdom and the United States of America, 78 per cent. of the skins exported in 1913-14 being taken by the former and 12 per cent. by the latter. The corresponding percentages for the two countries in 1914-15 were 78 and 11, respectively. Germany never took more than 3 per cent. of the tanned goat skins exported and her purchases of tanned sheep skins were negligible. The distribution of the trade according to countries from 1915-16 onwards is shewn in the table annexed.

TABLE No. 138.—*Percentage distribution of the trade in tanned goat and sheep skins among importing countries.*

Countries.	Goat Skins.				Sheep Skins.			
	1915-16.	1916-17.	1917-18.	1918-19.	1915-16.	1916-17.	1917-18.	1918-19.
United Kingdom	63·4	63·2	64·8	81·9	63·9	62·9	63·4	70·8
United States of America	36·2	35·8	34·6	15·1	19·8	24·2	22·1	16·0
Japan	·05	·13	·3	·08	10·7	9·7	6·7	9·7

Unit of sale and shipment.

As in the case of tanned hides, the greater portion of the exports goes from Madras, the percentages from Madras and Bombay respectively in 1913-14 being 84 and 13. Tanned skins are usually sold in the Bombay market per lb. and shipment is made in bales of 500 to 550 lbs. nett. The unit of sale in Madras is the lb. and that of shipment the pressed bale wrapped in gunnies and roped, weighing 500 to 600 lbs. nett in the case of sheep skins and 610 lbs. nett of goat skins. Quotations for export are per lb. *c. i. f.* or *c. f.*

Export duty.

With effect from the 11th September 1919 an export duty of 15 per cent. *ad valorem* has been imposed on all shipments of raw hides and skins from British India based on tariff valuations.

A rebate to the extent of two-thirds of the duty, however, is allowed in the case of exports to the United Kingdom and British Possessions including mandatory territories upon production of evidence that the hides or skins have been tanned within them.

P

OPIUM.

The opium yielding poppy (*papaver somniferum*) is an annual which grows to a height of from two to four feet. The capsules or seed pods from which the drug is obtained are while still green carefully scarified with a four-bladed instrument which causes them to exude a gummy sap and this operation is repeated three or four times at intervals of two or three days until the discharge is exhausted. The juice is scraped off and when coagulated forms crude opium, for which the flower petals, carefully collected and steamed, are used as packing.

The trade formerly recognized two descriptions of opium, based on the area of cultivation of the poppy: *Bengal* opium obtained from certain districts of the United Provinces and Bihar (which once formed part of the old Bengal Presidency) and *Malwa* opium the product of certain Native States in Central India, particularly Indore, Gwalior, Bhopal, Jaora, Dhar, Rutlam, Mewar and Kotah.

Malwa opium.

In Central India the opium collected is sold by the cultivator to middlemen from whom the large dealers again obtain their supplies. For export purposes the drug which was of 90° to 95° consistency was made up into balls of twelve ounces each and packed in half chests for despatch about the end of September. No statistics of the area under poppy were maintained, and no control was exercised by the British Government over either cultivation or manufacture; but as the States in which this opium is produced have no access to the sea except through British territory, the regulation of exports to China, the chief market for Malwa opium, used to be effected by making the issue of passes for transport to Bombay depend upon prior payment of duty by the successful bidders at auctions held monthly at the latter port. A few chests were also shipped annually to Zanzibar. The duty was at the rate of £40 per chest until 1912 when it was raised to £80. The last auction was held in January 1913 and the last shipment made in December of that year.

Bengal opium.

In British India cultivation is permitted only under license granted to cultivators who obtain advances from Government free of interest to meet the cost of production, on the understanding that the whole of their outturn is sold to the Government factory at Ghazipur (United Provinces) at a rate fixed by Government which is at present Rs. 7-8-0 (10 shillings) per seer for opium of 70° consistency. The opium trade was created a Government monopoly in 1773 and in 1817 the cultivation of the poppy except on account of the East India Company was forbidden. All opium was auctioned with the stipulation that it should be exported.

In British India, as in Native States, the area under opium has since 1907 been much curtailed owing to the agreement come to with the Chinese Government for the suppression of opium traffic with that country, and the opium factory at Patna closed. In 1908 an arrangement was made with China by which the total exports of opium from

India were to be reduced annually by 5,100 chests from an assumed standard of 67,000 chests and by a further agreement in 1911, the reduction was accelerated by further limitations, and exports to China have been discontinued altogether since 1913. In British India the cultivation of the poppy is now restricted to the United Provinces and the product is known as *Benares* opium. While 488,548 acres were under the crop yielding 71,340 maunds of opium in 1907-08, in 1911-12 the area was reduced to 200,672 acres producing 31,473 maunds and in 1913-14 to 145,000 acres. The seed is broadcasted in October and November and the capsules harvested in March and April.

Prices. The following table shews the price of opium per chest (of 140½ lbs.) at Calcutta during the years 1904 to 1918.

TABLE NO. 139.—*Price per chest of opium (of 140½ lbs.) in Calcutta from 1904—1918.*

Year.	*Rs. As.*	*£ s. d.*
1904	*1,657 8*	*110 8 0*
1905	*1,547 8*	*103 2 8*
1906	*1,352 8*	*90 2 8*
1907	*1,351 8*	*90 1 7*
1908	*1,322 0*	*88 2 2*
1909	*1,324 0*	*88 4 3*
1910	*2,053 8*	*136 14 5*
1911	*2,925 12*	*195 0 9*
1912	*3,208 8*	*213 14 5*
1913	*1,973 1*	*131 8 7*
1914	*1,562 0*	*104 2 8*
1915	*1,602 8*	*106 16 8*
1916	*2,317 2*	*154 10 0*
1917	*3,249 6*	*216 2 6*
1918	*3,234 0*	*215 12 0*

The cost of manufacture varied between Rs. 500 and Rs. 525 per chest. In July 1914, the price realised was Rs. 1,578, but upon the outbreak of war the market became much disturbed. At the August auction the average price realised was only Rs. 1,212 a chest. The decision was then taken to fix an upset price of Rs. 1,600, and though this arrested any further decline, 1,352 chests were left unsold at the close of the year. In subsequent years, as the table indicates, the prices have been on the increase, and in 1917 the figure for 1912 was exceeded. In 1918 the rate remained fairly constant, and in the beginning of the current year a further advance has been registered.

The present quantity offered monthly at auction is 300 chests *Benares* opium at a minimum price of Rs. 4,500 per chest. The only *Patna* opium now available is old stock belonging to dealers in Government custody pending shipment.

At the Ghazipur factory, two classes of opium are manufactured, *provision* opium which is intended for export and *excise* opium for home consumption, the duty on which varies in different provinces.

The former is made up in balls or cakes weighing $3\frac{1}{2}$ lbs. each, 40 cakes going to the chest, while *excise* opium is made up in cubic packets of one seer each, 60 packets to the chest. *Excise* opium is of higher consistency than *provision* opium. The native of India does not smoke opium but eats it.

The unit of sale as well as of shipment of *provision* opium is the chest.

Exports. The exports of opium on private account (quantities and values) from 1913-14 are shewn in the table below.

TABLE No. 140.—*Exports of opium on private account from 1913-14.*

Year.	Quantity	Value.
	Cwts.	£
1913-14	16,858	2,280,031
1914-15	15,912	1,175,639
1915-16	12,878	980,123
1916-17	12,760	1,397,680
1917-18	12,322	1,605,156
1918-19	15,345	2,086,049

Monthly auctions are held throughout the year to meet the demands of private trade. The bulk of the 300 chests offered at each sale goes to the Far East, Japan taking about 150 chests, and the balance is bought and held by shippers and speculators against inquiries from Saigon and Singapore. Indo-China requires about 1,500 chests every six months which are shipped from stocks *ex-godown*. On the 30th August 1919 these stocks amounted to 2,763 chests. The supply of opium to the Dutch East Indies, the Straits Settlements, Hongkong and Siam is arranged for by the Government of India under a system of fixed contracts. But in the case of Hongkong there are supplementary exports to the extent of 75 to 100 chests monthly on private account to a specially licensed importer. The quantities and values of opium shipped on Government account are indicated in the next table.

TABLE No. 141.—*Quantities and values of exports of opium on Government account since 1916-17.*

Year.	Quantity.	Value.
	Cwts.	£
1916-17	10,750	Not available.
1917-18	11,832	859,943
1918-19	9,609	715,015

The Government of India have also during the war been developing the supply of medicinal opium to England where they are anxious to capture and retain after the war the market formerly enjoyed by Turkish opium on account of the higher morphine content it was supposed to possess.

The revenue derived by the Government of India from opium since 1911-12 is shewn in the following table.

TABLE No. 142.—*Revenue derived from opium by the Government of India since 1911-12.*

Year.	Amount.
	£
1911-12	5,961,278
1912-13	5,124,592
1913-14	1,624,878
1914-15	1,572,218
1915-16	1,913,514
1916-17	3,160,005
1917-18	3,078,903
1918-19	3,229,000 (Revised budget estimate).
1919-20	3,056,200 (Budget estimate).

RAW WOOL.

Trade centres.

Indian wool falls for the most part in the lowest of the three classes into which the article is classified for trade purposes (*viz.*, merino, crossbreds and carpet wool) and the exports from India are generally for the manufacture of blankets, rugs, carpets and felt only, though some of the better quality Bikaner wool is good enough to be utilised for clothing. As compared with cotton, the internal consumption of wool in India is comparatively small as it is unsuitable as a clothing material in the climatic conditions prevailing over the greater part of the country. Further, and perhaps for the same reason, the wool of the Indian sheep is short stapled and in every respect inferior to that of Europe and Australia. The estimated production of wool in India has been placed in the neighbourhood of 60 million lbs. per annum on the basis of 2 lbs. per sheep, as compared with 7½ lbs. the average weight of an Australian fleece. The chief centres of the trade in raw wool in India are the Punjab, particularly the Hissar district; the United Provinces, particularly Garhwal, Almora and Naini Tal; Sind, Baluchistan and the Bikaner State. The largest marts for indigenous wool are at Fazilka and Beawar, at the former of which it is subjected to a certain amount of cleaning and, if intended for shipment, pressed and baled also. In the Bombay Presidency, the black Deccan and Khandesh wools and the white wools of Sind, Gujarat and Kathiawar have a recognised commercial value and in Southern India wool-bearing species of sheep are found in the Mysore State and the Bellary, Kurnool and Coimbatore districts of Madras. In other parts of the country the sheep yield hair without any felting qualities. A good deal of the wool which comes into the Indian market is dead wool, *i.e.*, wool that has been removed from the carcasses of slaughtered sheep and not shorn.

As regards imports, a great deal of wool enters India from Afghanistan of fairly good quality, but the indiscriminate intermixing of black and white wool of different staples and colour tends to lower the export value of what is shipped at Karachi. From Tibet, in addition to large quantities of ordinary wool, there is a considerable trade in shawl wool or *pashm*, the silky under-fleece of a particular species of goat which is superior in quality to any Indian wool. Quetta, Shikarpur, Amritsar and Multan are the chief collecting centres for wool received by land from Afghanistan and Central Asia, while the principal purchasing centres for Tibetan wool are Kalimpong on the Teesta Valley branch of the Darjeeling-Himalayan Railway and Tanakpore on the Oudh and Rohilkhand Railway. The mills in the United Provinces and Punjab also import considerable quantities of wool from Australia and intermittently from the Cape for the manufacture of woollen goods for which the indigenous article is not suitable. Of the imports of wool by sea no less than 70 per cent came from Persia. A good deal of the raw wool grown in, or brought across, the frontier into India goes into internal consumption but the export trade though less than a tenth of the value of that in raw cotton is nevertheless of considerable interest and importance. In pre-war times a Bombay estimate placed the total supplies of wool in India, indigenous and imported, in a normal year at about 220,000 bales of 3 cwts., of which 180,000 bales were exported and the balance went into mill and domestic consumption.

Imports.

The first recorded export of raw wool from India was in 1834 and the total quantity was rather less than 70,000 lbs. Two years later the figure was 1,200,000 lbs. and in 1872 24 million lbs., and the advance since has been steadily progressive. Very soon after the outbreak of war restrictions were placed on the exports of raw wool, chiefly in the interests of manufacturers in India executing Army clothing contracts, and in respect of all varieties of Tibet wool and the black and grey varieties of Madras wool the prohibition on export was made absolute with effect from the 15th January, 1915, shipment of other descriptions being allowed under license, subject to limit of quantity. The embargo as regards Tibetan wool was in abeyance between September 1915 and January 1916 and so great was the general demand for wool created by the war, particularly as clothing for troops, that the total volume of exports of wool from India (including re-exports) in spite of restrictions rose from 54½ million lbs. in 1914-15 to nearly 82 million lbs., practically all for the United Kingdom. Of the re-exports in this year no less than 15 million lbs. were shipped from Karachi. Early in April 1916 the export of wool was prohibited except to the United Kingdom and the sudden closure of the United States and other markets caused an immediate slump in prices. But the decline in exports both of Indian and transfrontier wool during the next twelve months was due rather to difficulties of freight and finance than to any embargo. This perhaps explains why Bombay wrested so considerable a share of the business from Karachi whose usual pre-war percentage of exports was 60.

War restrictions.

From the Indian point of view the further decline in exports registered in 1917-18 is satisfactory because it would appear to be due to the consumption, estimated at 500,000 lbs. monthly, of wool by handloom weavers and jail labour in the manufacture of blankets for military requirements; but this improvement was not maintained in the following year. Of the total exports of raw wool in this year about two-thirds were shipped from Bombay and the balance from Karachi.

The exports and re-exports of wool during the last six years are indicated in the table subjoined.

TABLE No. 143.—*Quantity and value of Indian and foreign wool exported from India from 1913-14 onwards.*

Year.	Exports.	Re-exports.	Total.	
	Quantity.	Quantity.	Quantity.	Value.
	Lbs.	Lbs.	Lbs.	£
1913-14	48,922,061	10,245,538	59,167,599	2,000,156
1914-15	44,610,287	9,923,433	54,533,720	1,913,326
1915-16	65,023,752	16,842,037	81,865,789	3,208,761
1916-17	48,829,840	13,120.881	61,950,721	3,262,175
1917-18	42,598,493	12,817,189	55,415,682	3,414,773
1918-19	47,376,163	15,662,076	63,038,239	4,590,128

The chief customer for Indian wool in pre-war days was the United Kingdom, though there were some exports *viâ* Calcutta of Tibetan wool to the United States of America, and to a limited extent Germany and France were also recipients.

Trade organisation.

In India the rearing of sheep and the production of wool are entirely in the hands of village shepherds who depend upon middlemen to purchase the clip from them. These middlemen, as is usual in other Indian trades, make monetary advances to the shepherds about six months or even earlier before the actual clipping season up to as much as 50 per cent. of the total price to be paid. The middlemen, after delivery of the wool, consign it to one of the principal Indian markets for sale outright there, though some of the bigger merchants arrange to forward the wool to Liverpool for sale on a consignment basis, through exporting agencies at Karachi and Bombay, each individual parcel being auctioned on its merits. The exporting firms who undertake this business arrange the freight and insurance and generally pay, through a guarantee broker, on the basis of a sterling bill at 3 months' sight a percentage advance in rupees on the estimated price of the wool which therefore virtually remains the property of the merchant till it has been warehoused, valued and sold. No sale by private treaty is permitted unless the wool fails to find a buyer at auction, and when a final settlement of accounts is made the shipper claims a net commission of 2 per cent. in Bombay and 3 per cent. in Karachi of which 1 per cent. in each case is paid to the broker. These auction sales were suspended during the war, though the

arrangements, other than as regards freight and insurance between the consignor and the exporting firms, were not disturbed.

The principal varieties of East Indian wool as shewn in the Liverpool Price Market Returns are *Bikaner, Joria, Kandahar* and *Marwar*, white and yellow, and *native* black and grey. As the consignments represent assorted and clean wool, the designations under which they are marketed should be regarded as trade names rather than indicating the district of origin.

The raw wool is generally picked and cleaned upcountry, but exporting houses make advances against pressed bales as soon as they come into their possession. The unit of sale in the Karachi market is the maund of 84 lbs. and in Bombay the candy of 21 Bombay maunds. Shipment is made from both ports in bales of 3 cwts. gross. In Madras sales are made per lb. and wool is shipped in bales of four to five hundred pounds. In Bombay while a good deal is pressed upcountry some of the wool intended for export reaches the port in *borahs*, and is sorted, pressed and graded there. It is usually made up in small lots, a consignment of more than a hundred bales being exceptional.

WOOL MANUFACTURES.

Woollen mills.

At the end of 1918 there were six woollen mills working in British India employing 40,980 spindles and 1,309 looms. There was also one mill in the Mysore State with 2,114 spindles and 45 looms. Three of these mills manufactured all classes of woollen and worsted goods and the remainder manufactured blankets only. The market for their manufactures is almost entirely in India itself and during the war they were all employed to their fullest capacity in meeting Government's war requirements, and in particular in supplying greatcoat cloth, serges and putties, flannels, blankets and hosiery. There are also in India not inconsiderable quantities of hand manufactures of felts and blankets as well as of *puttoo* and *pashmina* in Kashmir and the North-West Frontier Province. Handloom weaving is generally done with hand-spun yarn, though yarn spun in Indian mills is to some extent used for the manufacture of the better classes of carpets. For the manufacture of shawls in the Amritsar District, there has been for some years past a fairly large import of machine-spun worsted yarn. The exports of manufactured woollens by land from India were valued at £45,773 in 1914-15, but owing to the heavy demand made upon Indian manufactures, both mill and hand woven, for war purposes the value had fallen to £22,350 in 1918-19. The exports of woollen piecegoods have always been negligible and indeed have never exceeded 10,000 yards, and so also the trade in shawls, the number exported being 80,450 in 1908-09 and 1,566 only in 1918-19.

Carpets.

One of the results of the great exhibition of 1851 in London was to stimulate an interest in Indian pile carpets. These carpets which are for the most part hand-

knotted in the Punjab and the United Provinces are generally composed of a woollen pile on a cotton warp, though woollen warps with a silk pile are occasionally made to special order. The chief centre of the industry is Amritsar where there are about two hundred looms at work. The wool used, which comes chiefly from Bikaner or from Kerman in Persia *viâ* Nushki, is locally spun and dyed with vegetable colours. Other centres outside the Kashmir State are Multan in the Punjab, Jaipur and Bikaner in Rajputana, Agra and Mirzapur in the United Provinces, and Ellore in the Madras Presidency. Carpet manufacture is also a feature of a number of jails, as for example Lahore, Agra, Yeraoda (near Poona) and Vellore. In Northern India the weavers are for the most part Kashmiri Mahomedans. Rugs and carpets from beyond the frontier have for many years found their way into Northern India and the two most important trade centres for these imports, which come chiefly from Persia, Russia and Turkestan are Peshawar, the capital of the North-West Frontier Province, and Quetta. In 1886-87 the exports of carpets did not exceed £20,000 in value. At the beginning of the century there was an American boom and in 1903-04 the total exceeded £173,000, but this level was not touched again until 1910-11. The returns for the last six years are given in the table below.

TABLE No. 144.—*Exports of carpets and rugs from British India from 1913-14 onwards.*

Year.	Quantity.	Value.
	Lbs.	£
1913-14	1,640,770	153,446
1914-15	1,043,772	102,054
1915-16	1,581,869	145,320
1916-17	1,923,190	190,873
1917-18	777,186	99,495
1918-19	944,132	98,466

The chief recipients have always been the United Kingdom and the United States of America, and it is probable that many carpets consigned in the first instance to the former country were subsequently reshipped to New York. The Amritsar carpet manufacturers in particular specialise for the American market. Beautiful reproductions are made at Amritsar and Agra of famous old carpets in the Vienna, South Kensington and other museums.

METALS AND ORES.

Manganese.

Occurrence.

The exploitation of the manganese deposits in India dates from 1892. These deposits may be classified geologically as follows—

(*a*) deposits associated with rocks of the kodurite series, worked for export in the Vizagapatam District of the Madras Presidency ;

(*b*) deposits associated with rocks of Dharwar age, chiefly the gondite series, found in (1) the Balaghat, Bhandara, Chhindwara and Nagpur districts of the Central Provinces, (2) the Panch Mahals District in the Bombay Presidency, (3) the Gangpur State in Bihar and Orissa, and (4) Jhabua in Central India ; and

(*c*) lateritoid ores found in (1) the Singhbhum District in Bihar and Orissa, (2) the Jubbulpore District in the Central Provinces, (3) the Bellary District and the Sandur State in the Madras Presidency, (4) the Chitaldrug, Kadur, Shimoga and Tumkur districts of the Mysore State, and (5) Goa (also in true laterite).

Manganese quarrying began in Vizagapatam in 1892 and in the following year over 3,000 tons were exported. In 1900-01 90,000 tons were shipped but since then water troubles as the workings grew deeper and the depreciation of prices have made further exploitation of the ores, which are not first grade, scarcely profitable. The Central Provinces are now the largest producers of manganese.

The industry reached its zenith in 1907 when 902,291 tons were recovered and India deprived Russia of the first place among the world's producers of this metal. In 1908 there was a considerable decline. The total in 1913 was 815,047 long tons and the average for the quinquennium 1909—13 712,797 tons. Until the war broke out the fluctuations in the volume of exports were more or less directly correlated to variations of activity in the steel trade. Latterly an adventitious demand has sprung up in connection with the increased production of ferro-manganese, and the appreciation of prices has stimulated the quarrying of lower quality ores. The two existing iron and steel companies have manufactured since the war considerable quantities of ferro-manganese* and any expansion of this manufacture will be to India's advantage. The following table shews the quantity and value of manganese ore produced in India in 1918.

TABLE No. 145.—*Quantity and value of manganese ore produced in India in 1918.*

Provinces.	Quantity.	Value f.o.b. at Indian ports.	Value per ton.
	Tons.	£	£
Central Provinces	438,628	1,293,953	2·9
Bombay Presidency	38,095	99,047	2·6
Mysore	22,655	42,856	1·9
Bihar and Orissa	16,345	42,497	2·6
Madras Presidency	2,230	3,382	1·5
TOTAL	517,953	1,481,735	2·8

* Dealt with under manufactures of iron.

The number of workers employed in the manganese quarries is in the neighbourhood of 20,000 annually. The workings in British India are subject to a royalty of 2½ per cent. on the sale value at the pit's mouth, but as this is inconvenient to assess, the rate has been fixed as follows except in the case of Madras : ½ anna per ton of ore when the price per unit of first grade ore is 8 pence, and ½ anna for each additional penny in the unit price up to 11 pence. When the price per unit is 12 *d.* the royalty is 3 annas per ton of ore, an addition of one anna being made for each additional penny in the unit price up to 14 *d.*, the scale thereafter up to 18 *d.* being enhanced by a further 2 annas for every extra penny in the unit price. The royalties in Native States are generally considerably higher.

In Mysore labour is easily obtainable, but in the Central Provinces, Central India and Sandur it has frequently to be imported. Work is generally done through contractors who are paid at a fixed rate per 1,000 cubic feet of stacked and cleaned ore and for dead work at a given rate per 1,000 cubic feet of cavity made in the quarry or of waste measured, according as the 'deads' are hard or soft.

Exports.

The following were the exports of manganese ore from the 1st April 1913 onwards, according to ports.

TABLE No. 146.—*Share of the ports in the exports of manganese ore from 1913-14 onwards.*

Year.	Vizagapatam.	Bombay.	Calcutta.	Mormugao.
	Tons.	Tons.	Tons.	Tons.
1913-14	36,750	606,724	74,575	86,747
1914-15	14,250	365,286	61,054	...
1915-16	2,000	392,915	77,648	...
1916-17	7,950	388,296	233,337	...
1917-18	700	247,608	178,323	..
1918-19	*Nil.*	180,376	204,935	...

Freight has not been obtainable for shipments from Mormugao since the outbreak of war and considerable accumulations are still lying at the wharf side. It is cheaper to rail the bulk of the deposits in the Central Provinces to Bombay rather than to Calcutta for shipment.

The distribution of Indian manganese ore in the quinquennium 1909-10 to 1913-14 discloses that out of the total of more than 3,000,000 tons 966,000 went to the United Kingdom, 750,000 to Belgium, 661,000 to the United States of America, 485,000 to France, while Holland took 93,000, Germany 33,000 and Japan 19,000.

Unit of sale and shipment.

The unit of sale is the percentage of *Mn* (manganese) contained in each ton of ore and shipment is made by the ton. Ore containing 50 per cent. and upwards of *Mn* is considered first grade, 48 to 50 per cent. second grade and 45

to 48 per cent. third grade. The price per unit in July 1914 for ore of these three grades delivered at a port in the United Kingdom was respectively 9¼ to 9½ *d*, 9 to 9¼, and 8¾ to 9 *d*.

Iron and Steel.

Iron and steel manufacture.

Though deposits of iron ore of good quality have been proved in many parts of India they seldom lie sufficiently adjacent to the necessary coal supplies to justify working them on modern lines for the production of iron and steel. Iron smelting by primitive methods was at one time a wide spread industry all over the sub-continent, and pig iron has been turned out at Kulti since 1875, but it was not until 1914 that the manufacture of steel in India by modern processes was successfully demonstrated. The imports of iron and steel (including galvanised iron, tin plates, railway plant, etc.), in 1913-14 amounted to over 1,250,000 tons valued at £17 millions. In addition the value of machinery imported exceeded £5,000,000, including prime movers £553,000, electrical machines £345,000 and textile machinery £2,186,000. There is thus an enormous field open to those who would develop the manufacture of iron and steel in India, a field in which at present there are only two companies working on European lines, the Bengal Iron and Steel Company at Kulti (Bengal) and the Tata Iron and Steel Company at Jamshedpur (late Sakchi) in Bihar and Orissa. The former works, in which ten thousand men are employed, were opened in 1875 but were not a paying concern until comparatively recently. With four blast furnaces they have a potential output of 320 tons of pig iron a day, equivalent to a normal production of nearly 10,000 tons a month. The output in 1916 was 92,244 tons and in 1917, 80,252 tons. In addition a single furnace has since November 1917 been responsible for 1,200 to 1,500 tons of ferro-manganese a month which, while the war lasted, was destined for the consumption of the Allies. The Tata Iron and Steel Company which was floated in 1907 owns valuable iron ore concessions in the Mayurbhanj State in Orissa and the Raipur District of the Central Provinces, manganese ore deposits in the Balaghat District of the Central Provinces, magnesite and chromite in Mysore, and coal in the Jherria field. The works were completed in 1911, in September 1912 a second blast furnace was blown in, and three more are under construction. Difficulties were at first experienced in connection with the manufacture of steel, but these have now been overcome and the present steel output capacity is 17,000 tons a month. Before the works were started the Government of India placed a standing order with the works for 20,000 tons of steel rails annually for ten years for State Railways, but the demands of the Munitions Board have during the last two years largely exceeded this figure. In 1917 the works produced 167,868 tons of pig iron and 72,670 tons of rails as compared with 152,460 and 36,595 tons respectively in the previous year. In 1918 the corresponding figures were 198,064 tons and 71,069 tons.

The Indian Iron and Steel Company with a share capital of ... s recently been floated to start the manufacture of pig iron, steel, ro-manganese, etc., at Asansol, 130 miles from Calcutta near an im-rtant railway junction and close to the Raniganj, Jherria and Barakar alfields. The initial plant which will include two blast furnaces ipable of producing 300 tons of pig iron or 200 tons of ferro-manganese aily and by-product recovery coke ovens is in course of erection.

Exports.

The exports of pig iron, ferro-manganese, and iron and steel manufactures during the last six years are shewn in the table below.

BLE No. 147.—*Quantities and values of exports of pig iron, ferro-manganese and of iron and steel manufactures from 1913-14 onwards.*

Articles.	1913-14.		1914-15.		1915-16		1916-17.		1917-18.		1918-19.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Tons.	£	Tons.	£	Tons.	£	Tons.	£	Tons.	£	Tons.	£
ig iron .	82,592	282,418	52,055	182,613	71,378	249,619	102,329	357,29[illegible]	49,782	200,608	9,596	70,497
'erro-manganese.*	..	..	..	..	..	..	2,608	60,424	2,101	38,346	10,878	272,045
Iron and steel manufactures.	828	12,725	447	6,912	1,208	15,032	749	15,667	2,859	16,040	813	17,268

*Not previously recorded separately.

Practically the whole of the above was shipped from Calcutta. The chief markets for pig iron have been Japan and the Australian Commonwealth, while manufactured goods went mainly to Aden, Maldives, Bahrein Isles, and East Africa. Exports of ferro-manganese were mainly to the United States of America and France.

Gold.

Chief producing areas.

India contributes only about 2 per cent. of the world's produce of gold and occupies the seventh position among the gold producing countries of the world About 95 per cent. of the Indian output is obtained from the Kolar field in eastern Mysore, about forty miles from Bangalore, where there is single gold-bearing reef of quartz some four miles long. Rather less tha 2 per cent. is obtained from Hyderabad and the balance comes from tl Anantapur field in the district of that name in the Madras Presidenc The prosperity of the Kolar gold field dates from 1885 and the hi water mark of output was reached twenty years later when 631,116 o valued at £2,373,457 were recovered, and £1,066,615 was paid out dividends by the five companies working the reef. Since then th has been some fluctuation in the output though within comparativ narrow limits, the value in 1913 being £2,150,194 and in 1[illegible] £2,067,541.

Electrical power provided from the falls of the Cauvery River a Sivasamudram, 92 miles distant, was brought to the field in 1902 and has since been added to, the supply now amounting to 12,000 kilowatts. In addition the Kolar mines power station, originally started to supplement the hydro-electric supply with electricity generated by steam power, is a valuable stand-by in the event of any interruption to the main transmission line.

The mines are thoroughly well equipped and efficiently managed. The cyaniding process is employed to deal with the tailings. The deepest workings exceed 5,000 feet in the Ooregum mine.

The royalty paid to the Mysore Government is in the neighbourhood of £70,000 annually (apart from the charges for electric energy at the rate of £12 per kilo-watt year) while the number of persons employed is according to the latest figures 25,500. The whole of the output of gold was until 1914-15 exported from Bombay in the form of ingots for refining, but latterly a considerable portion of it has been taken over by the Bombay mint for coinage purpose. In 1918 2,109,660 gold *mohurs*, equivalent in weight and fineness to the sovereign, were coined at the Bombay mint, and thereafter up to April 1919, when minting was suspended, 1,295,644 sovereigns were coined. Between the years 1914-15 and 1918-19 over 2½ million ounces of mint standard gold were received by the Bombay mint from the South Indian mines.

The other productive gold mines are the Hutti mine in the Lingsagar District of Hyderabad State, which in 1914 yielded over £80,000 worth of gold, the Anantapur field in the Anantapur District of the Madras Presidency, and the Dhalbhum field in Chota Nagpur where, however, operations have scarcely gone beyond the prospecting stage. About ten years ago a good deal of expenditure was incurred in the exploitation of the Dharwar field which lies partly in the district of that name and partly in the Sangli State in the Bombay Presidency, but the reef proved too poor to work profitably and the attempt was given up in 1911. The gold dredging in the bed of the Irrawaddy along a stretch of some 120 miles between Myitkyina and Bhamo in which a good deal of capital has been sunk has proved disappointing.

TABLE No. 148.—*Value of gold produced in India from 1913 onwards classified according to provinces.*

Provinces.	1913.	1914.	1915.	1916.	1917.	1918.
	£	£	£	£	£	£
Mysore	2,150,194	2,159,604	2,185,409	2,124,129	2,067,541	1,935,785
Hyderabad	77,228	80,479	68,338	71,577	52,013	44,936
Madras	43,194	82,959	101,324	94,789	87,066	67,219
Burma	20,767	14,295	12,340	7,710	4,248	739
Punjab	517	994	604	810	857	541
United Provinces	17	24	31	31	31	27
Bihar and Orissa	..	..	1,800	3,977	10,133	9,905
TOTAL	2,291,917	2,338,355	2,369,846	2,303,023	2,221,889	2,060,152

Silver.

Production.

Silver has only within the last decade been added to the list of metals won within the confines of the Indian Empire. Nearly the whole output comes from the Bawdwin mine in the Northern Shan States in Upper Burma but is quite insignificant in comparison with the country's requirements, India being by far the largest consumer of silver in the world.

TABLE No. 149.—*Production and value of silver in India from 1913 onwards.*

Provinces.	1913.		1914.		1915.		1916.		1917.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Oz.	£.	Oz.	£.	Oz.	£.	Oz.	£.	Oz.	£.
Burma—										
Bawdwin	125,209	15,338	236,446	26,896	284,875	31,099	759,012	88,552	1,580,557	237,083
Madras Presidency— Anantapur	..	..	..	..	512	51	1,362	136	1,281	133

The total output of silver at Bawdwin in 1918 was 1,970,614 ounces valued at £295,592 and the smelting plant at Namtu when completed will be capable of producing nearly 2½ million ounces of silver yearly. The Anantapur gold field contributed the balance of 1,169 ounces valued at £104.

The whole of the silver produced in Burma was taken over at a fixed rate by the Government of India for the purpose of minting.

Tungsten.

Tungsten is necessary for the manufacture of high speed steel, and in the form of wire for the filaments of incandescent lamps, while tungstates are employed in dyeing and fire-proofing and other industrial processes. Until ten years ago the chief source of supply of the metal was the United States of America but to the estimated total world's production of 10,000 tons of tungsten concentrates carrying 60 to 70 per cent. of tungstic trioxide (WO_3) in 1917, Burma contributed about a third. India's position as the principal producer of wolfram is now threatened by China which is estimated to be in a position to put 7,000 tons annually on the market.

Production.

The exploitation of the Tavoy and Mergui districts for this metal which occurs in the form of wolframite, to the existence of which attention had been drawn by the Geological Survey, only began in 1909. The output for the statistical year ending on the 31st March 1910 was 100 tons and though 262 tons were obtained during the remaining months of 1910, progress was for a time hampered not only by lack of communication and

difficulties of transport but also by shortsighted and wasteful methods of extraction, the labour employed being chiefly Chinese and Telegu. The production figures of subsequent years for the Tavoy District are given in the following table.

TABLE NO. 150.—*Output* of wolfram concentrates from Tavoy from 1911 onwards.*

Year.	Quantity.
	Tons.
1911	1,091
1912	1,499
1913	1,508
1914	1,630
1915	2,115
1916	3,034
1917	3,654
1918	3,636

Until the outbreak of the war practically the whole of the wolfram won was exported to Germany for metallurgical treatment. Since 1914 the whole of it has been taken over by the Home Government at controlled rates (latterly 60 shillings per unit) and the efforts made to encourage the production of the mines have met with very satisfactory response. Communications have been improved and all the important mines rendered easy of access. The acute shortage of labour was met by the importation of Chinese through Government agency and later by the employment of Burmese 'ticket of leave' *coolies.* Scientific mining methods have been introduced both in underground work and in the treatment of the surface deposits, which are of unusual extent and value. Hydraulic mining, through the use of monitors, is practised on several properties. Hydro-electric power schemes are in operation on one or two mines and others are under examination. Modern concentrating mills for the recovery of wolfram and tin from crushed quartz have been designed and erected. Deep level development, made possible by the installation of air compressors and machine drills is being proceeded with on the larger mines. The field is emerging from the time when it depended on the cobbing hammer, pan, and sluice box.

At Byingyi in the Yamethin District wolfram is now being profitably exploited, and in the Southern Shan States is situated the important wolfram-cassiterite mine of Mawchi. There are productive deposits in the Thaton and Amherst districts, and from Mergui 368 tons were exported in 1917. There are vast tracts of country lying between the deposits hitherto proved, which are difficult of access and await the enterprising prospector's attention. Outside Burma the only mines now producing wolfram are at Degana on the Jodhpur-Bikaner Railway in Rajputana and to a very small extent at Singhbhum in Bihar and

* Based on royalty returns and not actual shipments.

·issa. Insignificant occurrences have also been discovered in the ıgpur District in the Central Provinces and the Trichinopoly District the Madras Presidency.

ıBLE No. 151.—*Quantity and value of tungsten ore* produced in India according to provinces in 1918.*

Provinces.	Quantity.	Value.
	Tons.	£
Burma—		
Tavoy	3,636	610,833
Mergui	377	52,491
Southern Shan States	287†	41,615
Thaton	92	13,663
Kyaukse	·1	17
Rajputana—		
Marwar	37	7,205
Bihar and Orissa—		
Singhbhum	2	498
TOTAL	4,431	726,322

* *i.e.*, wolfram concentrates.

† See note under Tin.

In 1917 the total mine production was 4,542¼ tons. The figures of export which are compiled for the statistical year (April to March) amounted to 4,782 tons in 17-18 and 4,870 tons. in 1918-19. Practically the whole of the ncentrates go direct to the United Kingdom, but there have been casional shipments *viâ* the Straits Settlements.

Exports.

The unit of sale is the percentage of WO_3 in the concentrate. Each shipment is assayed and this percentage deter mined and the price per ton a rived at. The ice before the war was about 35 shillings per unit and it was fixed by ·vernment at 55 shillings and subsequently at 60 shillings equivalent th an assay of 60 per cent WO_3, to £180 a ton. The unit of ship- ·nt of the concentrate is the bag varying in weight from 56 to 112 lbs.

Unit of sale.

The removal of controlled prices and the Chinese competition s dealt the Bu ma wolfram mines a severe blow, but it is hard to believe ıt they will not be able to hold their own in the future when markets : their products assume a normal state again.

Tin.

Tin mining is now a definitely established industry in Burma. The value of the output exceeded £50,000 in 1912 of which seven-tenths and three-tenths were ntributed by block tin and tin ore, respectively. All the foreign ports of tin are from Burma where cassiterite is obtained by washing uvial gravels, chiefly in the Mergui and Tavoy districts.

Production.

TABLE No. 152.—*Production of tin and tin ore in Burma in 1918.*

Producing areas.	Block tin.		Tin ore.	
	Quantity.	Value.	Quantity.	Value.
	Cwts.	£	Cwts.	£
Burma—				
Southern Shan States	...	...	7,609	51,361
Tavoy	...	...	4,053	31,056
Mergui	2,014	28,123	1,471	12,432
Thaton	...	...	1,157	2,896
Amherst	...	...	1,317	8,767
TOTAL	2,014	28,123	15,607	106,512

In 1917 only 1.762 cwts. of tin ore were produced in Tavoy. Most of the tin won in the Mergui District is smelted locally by Chinamen in small native furnaces and the block tin obtained goes into local consumption in India and Burma, but practically the whole of the ore from other localities is exported in the form of high-grade concentrates. In the case of mixed tin and wolfram concentrates the ore used formerly to be shipped in the first instance to the Straits Settlements for separation. A separating plant has now been put up at Tavoy, but large quantities of mixed concentrates are still shipped from Burma untreated to England for separation there. The estimate of 7,609 cwts. credited to the Shan States in the above table under the head of ore is calculated on an average proportion of 57 per cent. tin in the total quantity of 13,349 cwts. of concentrates produced in 1918, the balance being credited to wolfram in table No. 151 which will be found in the article on tungsten.

TABLE. No. 153.—*Exports of tin and tin ore during the last six years from Burma.*

Year.	Foreign.		Coastwise.	
	Quantity.	Value.	Quantity.	Value.
	Cwts.	£	Cwts.	£
1913-14	4,212	24,482	1,466	13,729
1914-15	2,300	12,934	1,547	13,018
1915-16	1,741	8,823	2,178	18,549
1916-17	4,281	23,453	1,662	16,093
1917-18	6,004	42,450	2,323	26,466
1918-19	7,423	62,268	1,880	25,165

Lead.

Occurrence.

The exports of lead from India are entirely confined to Burma and are the produce of a single mine, that of Bawdwin in the Northern Shan States which is owned by the Burma Mines Ld., but financed by another company called the Burma Corporation. On the 30th June 1918 the ore reserves of this mine stood at 4,300,000 tons assaying 24·2 oz. of

silver, 26·8 per cent. of lead, 18·72 per cent. zinc and ·07 per cent. copper, of which 3,793,000 tons have been proved. The existence of this mine had long been vaguely known and it had been worked by Yunnanese for its silver until about 50 years ago. When the concession over this area was first taken up in 1902 enormous heaps of lead slag were found which had been abandoned by the Chinese after extracting some of the lead and nearly all the silver.

Until the end of 1908 practically no smelting was carried on, but in 1909 a light railway from the mine to Nam Yao on the Shan States branch of the Burma Railway close to Lashio was completed, and nearly 12,000 tons of lead slag and 485 tons of ore obtained from open-cut working were transported to Mandalay, and 5,030 tons of lead and 27,000 ozs. of silver obtained from them.

At the end of 1911 the smelting plant was transferred from Mandalay to Namtu which is about 15 miles from Bawdwin and 36 miles from Nam Yao and a refining plant also set up. The ores which are very rich, consist of argentiferous galena and zinc-sulphide and a small quantity of copper pyrites, with traces of antimony and nickel. A hydro-electric power scheme has been put in hand and the smelting capacity of the works is being increased. When these works are completed, the outturn of required lead will be 31,500 tons annually for which there should be no difficulty in finding a market in China and Japan after supplying India's entire wants.

A very large staff is employed at the mine and at Namtu, the superior staff being chiefly American, while the *coolies* who number between seven and eight thousand are for the most part Shans or Yunnanese.

The present scale of working is some 150 tons of galena per day, which yields about 50 tons of lead and 5,000 ounces of silver.

Imports.

Between 1908-09 and 1913-14 the average value of lead imported in India was £140,000, chiefly in the form of sheet lead for tea chests but also lead for pipes, sheets, and tubes and pig lead.

Exports.

The production of the Bawdwin mine in 1918 amounted to 50,679 tons of ore yielding 17,507 tons of pig lead, and 2,042 tons of slag yielding 760 tons of pig lead, the total value of both being £431,101. The following table shews the recorded foreign exports of lead during the last six years.

TABLE No. 154.—*Quantity and value of foreign exports of lead from 1913-14 onwards.*

Year.	Quantity.	Value.
	Cwts.	£
1913-14	69,862	59,309
1914-15	130,365	115,210
1915-16	216,955	239,028
1916-17	208,431	364,895
1917-18	211,397	339,510
1918-19	185,951	287,121

In 1914-15 over 2,000 tons went to Ceylon, chiefly for tea chests, and in 1916-17 4,500 tons. In addition to these exports, there was a large and increasing coasting trade with India, which amounted in 1916-17 to 57,164 cwts. and in the following year to 116,246 cwts. In 1918-19, the increase was more marked as the total quantity reached 173,504 cwts. valued at £282,390.

Zinc.

Occurrence.

The principal occurrence of zinc in India is in association with the silver-lead ores of Bawdwin in the Northern Shan States. The zinc won from this mine was until the outbreak of war chiefly exported to Antwerp and Hamburg in the form of ore for conversion into spelter, and when these outlets were closed there was temporarily a large accumulation of stocks at Rangoon. A mill is in course of erection at Namtu to deal with both lead and zinc concentrates, an experimental plant to separate the galena from the zinc sulphide having yielded satisfactory results. At present a great deal of zinc is lost in the lead smelting works partly by volatilisation and partly in the residual slag from which, though it contains about 20 per cent. zinc sulphide, the recovery of the metal is considered impracticable. Zinc ore has a particular value for India apart from its metallic content as a potential source of sulphur. The Government of India is therefore interesting itself in the proposal to erect zinc smelting works at Jamshedpur where the zinc concentrates from Bawdwin will be dealt with, and the spelter and sulphuric acid yielded made available to the Tata Iron and Steel Company for their own purposes and for subsidiary companies. The plant which it is proposed to erect with a loan from Government, will be capable of dealing with 25,000 tons of zinc concentrates and the estimated output is 10,000 tons of spelter per annum. The following table shews the exports of zinc ore from Burma during the last six years.

TABLE No. 155.—*Quantity and value of zinc ore exported from Burma from 1913-14 onwards.*

Year.	Quantity.	Value.
	Tons.	£
1913-14	7,627	31,400
1914-15	4,887	22,800
1915-16	87	5,000
1916-17	3,198	15,733
1917-18	2	10
1918-19	*Nil.*	*Nil.*

The whole of it was obtained from Bawdwin. In 1916-17 a considerable amount of ore went to Japan and the balance to the United Kingdom. Exports practically ceased in 1917-18, when experimental work began at Namtu in connection with concentrates.

Copper.

Though the internal consumption of copper in India exceeds in value £2,000,000 annually, attempts to work commercially the indigenous deposits of the mineral have met with very limited success so far. A certain quantity of argentiferous copper-ore occurs in association with the lead-zinc ore bodies of the Bawdwin mines in the Northern Shan States of Burma, and the existence of considerable quantities of copper in Sikkim has been established, but it remains to be seen whether its extraction is commercially possible. A great deal of money has been lost in the attempt to exploit the copper deposits in the Singhbhum District of Chota Nagpur in the province of Bihar and Orissa during the past fifty years. Latterly the Rakha mine which the Cape Copper Company have been working since 1909 has shewn such promise (with ore reserves of a payable grade believed to exceed 450,000 tons) that a smelting plant capable of producing 1,000 tons of refined copper annually has been erected, and smelting for blister actually begun. The following table shows the output of copper ore from this mine since 1910. The decrease in 1918 is ascribed to temporary causes. No copper has been or will be exported, except small quantities of ore for testing purposes until the plant for treating the ores is in full working order.

Production.

TABLE No. 156.—*Output of copper ore in Chota Nagpur from 1910 onwards.*

Year.	Quantity.	Value.
	Tons.	£
1910	864	2,304
1911	2,079	2,911
1912	8,984	13,476
1913	3,639	6,085
1914	4,400	6,600
1915	8,010	12,015
1916	2,173	3,259
1917	20,108	30,162
1918	3,619	4,053

Chromite.

Chromite is mined in Baluchistan, in the Mysore, Shimoga and Hassan districts of Mysore, and the Singhbhum District of Chota Nagpur in the province of Bihar and Orissa. There are also occurrences in the Andaman Islands and in the Salem District, Madras Presidency. The ore is used in the manufacture of ferro-chrome and chrome steel, while the salts of chromium are largely used in connection with tanning and dyeing. The quantity and value of chromite produced in 1916, 1917 and 1918 are shewn overleaf. The increase in 1918 in the Mysore output is due to the successful opening up of the Bhairapur deposits.

Occurrence.

TABLE No. 157.—*Quantity and value of chromite produced in India during 1916, 1917 and 1918.*

Provinces.	1916.		1917.		1918.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Tons.	£	Tons.	£	Tons.	£
Baluchistan	7,620	7,620	15,659	15,659	22,944	22,944
Bihar and Orissa	2,737	2,495	3,266	3,111	1,085	1,644
Mysore	9,802	6,286	8,136	7,446	33,740	27,474
TOTAL	20,159	16,401	27,061	26,216	57,769	52,063

Exports. The pre-war average did not exceed 6,000 tons annually and went to Hamburg, whence it probably found its way to Essen. At the outbreak of war a German firm in Calcutta had a large quantity collected and ready for shipment. In 1916-17 six thousand tons were shipped, and in 1917-18 nearly fifteen thousand, and more would have probably gone forward if freight had been available, the deposits at Hindubagh being now linked up *viâ* Khenai with the Bostan-Bolan Section of the North Western Railway. 82 per cent. of the whole went to the United Kingdom and the balance to Italy and Japan. In 1918-19, the total shipments from India aggregated 39,381 tons, of which 12,740 tons of Mysore ore valued at £28,000 were shipped from Madras (in the absence of freight from Mormugao) chiefly to the United Kingdom for munition purposes.

Unit of sale. The price is governed in the United Kingdom by the percentage of sesquioxide of chromium contained in the ore, payment being generally made on a 50 per cent. basis after analysis. A return of 2 shillings to 2*s*. 6*d*. per unit above or below 50 per cent. is usually made to the seller or buyer as the case may be, after the percentage has been ascertained. The demand in the United Kingdom is for ore with 48 to 52 per cent. chrome content, and the chief competitors of India in the London market are New Caledonia and Rhodesia.

Corundum.

Production. The occurrences of corundum in India (chiefly in the form of crystals) are widely distributed, but little organised mining has yet been attempted and the returns of production are incomplete. Corundum is found in considerable quantities in Mysore and the other chief areas of occurrence are the Khasi and Jaintia hills in Assam, the Trichinopoly District of the Madras Presidency, and the Rewah State in Central India. The following are the statistics of production available from 1913 onwards.

TABLE No. 158.—*Production of corundum in India from 1913 onwards.*

Year.	Quantity.	Value.
	Cwts.	£.
1913	7,960	2,022
1914	2,360	447
1915	1,246	277
1916	37,361	2,783
1917	41,426	3,875
1918	39,281	4,106

Corundum, on account of its use as an abrasive, is a regular item of trade in most Indian cities where the lapidary still flourishes and it is collected in a casual way by agriculturists and cowherds who dispose it of through the village *banias* to the large dealers.* The shortage of foreign supplies greatly encouraged mining activity in Assam in the last three years for which figures of production are available, the output from which area in 1918 aggregated 1896 tons. In view of the competition of carborundum manufactures in the United States and the commercial extraction of corundum from felspar in Canada, the Indian export trade is never likely to attain any considerable dimensions. No separate statistics of exports are maintained.

Monazite.

The monazite sands of Travancore owe their economic importance to the fact that they contain a percentage of thoria, from which thorium nitrate used in the manufacture of incandescent gas mantles is derived, ceria and other rare earths. In 1911 the occurrence of these sands near Cape Comorin was exploited by a concern which eventually came under German control, and the concentrates to the extent of 3,200 tons extracted during 1911 and 1913 were said to have been shipped to Hamburg, the manufacture of thorium nitrate in India having never yet been attempted. Previous to the discovery of monazite in Travancore, Brazil enjoyed a monopoly. Occurrences in the Tinnevelly district of the Madras Presidency east of Cape Comorin, near Waltair in the Vizagapatam District, as well as in the Cochin State, have since been reported.

Occurrence.

The following table indicates the production of monazite from 1911 onwards.

TABLE No. 159.—*Quantity and value of monazite produced in India.*

Year.	Quantity.	Value.
	Tons.	£
1911	832	24,044
1912	1,135	41,419
1913	1,235	42,012
1914	1,186	41,411
1915	1,108	33,238
1916	1,292	37,714
1917	1,940	56,489
1918	2,117	58,819

* Holland, Hayden and Fermor's Mineral Production of India, 1909-13, p. 266.

Exports from Travancore in the same period, foreign and coastwise, amounted to 7,706 tons of an approximate value of £220,000. German interests have, of course, long since been eliminated and the Company reconstructed with British capital. The exports amounting to 604 tons valued at £27,000 and 882 tons valued at £40,000 in 1917-18 and 1918-19 from the British Indian port of Tuticorin were probably for the most part of Travancore monazite. The principal recipient was the United States of America, and next to her came the United Kingdom. Small quantities were also taken by Japan.

Exports.

The unit of shipment in Tuticorin is the bag of one cwt.

Magnesite.

The principal occurrence in India of magnesite, which is of value as a source of carbon dioxide and as a refractory material, is over an area of about 4½ square miles in the Chalk Hills near Salem, in the Madras Presidency. The only other occurrence being systematically worked at present is in the Mysore District of the Mysore State. This magnesite is used for the manufacture of fire-bricks at Kumardhubi for the furnaces at Messrs. Tata's Steel Works at Jamshedpur. Analysis of Salem magnesite shews an average content of magnesium carbonate of between 96 and 97 per cent. The magnesite is calcined on the spot to produce caustic magnesia obtained at a temperature of about 800° C and exported in that form, the manufacture of dead burnt magnesia which involves calcining at a temperature of 1,700° C having been abandoned since 1911 owing to the cost of fuel. Apart from its value in the preparation of cement and for the manufacture of bricks for furnace linings there is also a possibility of Indian magnesite being used hereafter for the production of magnesium sulphate or Epsom salts.

Occurrence.

While 3,450 tons of crude magnesite were mined in 1902, the figure for the following year was 825 tons only and in 1909, 737 tons. In 1910, 5,182 tons and in 1911, 3,490 tons were recovered. There was thereafter a marked development in 1912 and 1913, and again in 1916 and 1917.

TABLE No. 160.—*Quantity and value of magnesite produced in India from 1912 onwards.*

Year.	Quantity.	Value.
	Tons.	£
1912	15,379	4,614
1913	16,198	4,776
1914	1,680	557
1915	7,450	3,974
1916	17,640	14,365
1917	18,202	14,559
1918	5,853	4,641

The quantities and values of calcined magnesite exported during the last six official years are shewn below. In addition to the figures there given about 300 tons of lump calcined magnesite and 2,300 tons of crude magnesite were exported to the United Kingdom in 1916-17, and in 1917-18 nearly 6,500 tons of crude magnesite.

Exports.

TABLE NO. 161.—*Quantities and value of calcined magnesite exported from the Madras Presidency from 1913-14 onwards.*

Year.	Quantity.	Value.
	Tons.	£
1913-14	3,824	8,922
1914-15	7,064	11,896
1915-16	8,097	18,213
1916-17	6,848	14,991
1917-18	6,471	11,789
1918-19	1,147	5,822

In 1913-14 only 6 per cent. of the total went to the United Kingdom and 55 per cent. to Germany and 39 per cent. to Belgium. Since the outbreak of war nearly the whole of the export has gone to the United Kingdom except in 1915-16 when 3,000 tons were shipped to France.

The unit of sale in Madras for calcined magnesite is the ton and shipment is made in bags of 185 or 190 lbs.

LAC.

Lac is the resinous exudation of certain scale insects of the genus *tachardia*, frequenting particular trees, the nature of the host being an important factor in the resultant crop. The best lac is obtained from the *schleichera trijuga* (*kusumb*) but very large quantities are derived from other species such as the *butea frondosa* (*palas*), *acacia arabica* (*babul*) and *zizyphus jujuba* (*beer*) while the *albizzia lebbek* (*siris*), *shorea robusta* (*sal*), *ficus religiosa* (*pipul*) and *cajanus indicus* (*arhar*) are also suitable hosts for the insect. The cultivation of lac is probably one of the oldest minor industries in India, and if the dye was originally valued more than the resin it yielded, the latter is referred to as a wood varnish as far back as the beginning of the 16th century in the *Ain-i-Akbari*.

Cultivation.

Lac is obtained in India from four main areas, (1) the Central India area including Chota Nagpur and the adjoining districts of Orissa, Bengal and the United Provinces, the north-eastern forests of the Hyderabad State and the Central Provinces generally, and the Chattisgarh and Nagpur divisions in particular (*palas* and *kusumb*), (2) Sind (*babul*), (3) Central Assam (*pipul* and *arhar*) and (4) Upper Burma and the Shan States (*pipul* and

Area and occurrence.

palas). There is sporadic cultivation elsewhere, for example, in the Punjab (*beer*), and the principal factories are situated in the United Provinces (Mirzapur and Balrampur) and Bihar. There are also two factories in Calcutta where shellac is manufactured by special processes on a considerable scale. In certain grades the best machine-made lac cannot compete with hand-made.

Production.

No actual estimate of production is possible owing to the difficulty of obtaining reliable statistics of the sticklac crop, and this uncertainty makes lac a highly speculative trade and leads to frequent fluctuation in the market values. For example, in 1903-04 the price rose to 230 shillings per cwt. and the stocks in London were as low as 12,000 chests while the heavy exports of 1908-09 and the following year brought the price down to 60 shillings, with 100,000 chests unsold. At the time of the outbreak of war the price of T. N. shellac on the London market was only 59 shillings per cwt., and in the next twelve months prices fell so rapidly that the Calcutta price (Rs. 22 per maund) was scarcely high enough to justify collection and manufacture. It was only in July 1915, when fresh uses came to be found for it as a varnish for shells, etc. and shellac was declared contraband of war, that a revival of prices began.

TABLE NO. 162.—*Prices per bazaar maund in Calcutta of T. N. shellac monthly, from August, 1914.*

Months.	1914	1915	1916	1917	1918
	Rs.	Rs.	Rs.	Rs.	Rs.
January	...	30½	32	68	93
February	...	28½	35	72	89
March	...	27	36	85	95
April	...	25	38	99	91
May	...	25	40½	85	83
June	...	24	41	92	90
July	...	23½	43	87	94
August	26	25	60	87	96
September . . .	(Market closed).	27½	63	80	92
October	23	29	52	58	96
November . . .	24	31	61	62	97
December . . .	26	37½	74	92	100

There are four distinct crops of shellac in India known as *bysaki*, *kushmi*, *katki* and *jethwa* respectively in order of commercial importance, though the *katki* crop is generally larger than the *kushmi*. The average annual production of sticklac in India may be placed in the neighbourhood of 730,000 cwts. to which should be added 20,000 cwts. from Siam and Indo-China, the only other producing countries, to arrive at the world's figure of three quarters of a million cwts., representing about 350,000 cwts. of shellac, a maund (forty seers) of sticklac yielding on an average about eighteen seers of shellac.

Trade descriptions.

Sticklac is the incrustation on the twigs of the tree which contains three main constituents, lac resin, the outermost portion of the incrustation, lac wax, immediately surrounding the lac insect, and lac dye contained in the body of the insect itself. Sticklac when ground and sifted and washed free of so much of the dye as is soluble becomes *seedlac* or *grainlac*, which is converted into *shellac* by fusing it over a slow fire. A small quantity of orpiment is frequently added to produce the light yellow colour required in the finer grades, and an admixture of rosin (colophony) is also occasionally made to lower the melting point. The mixture is then fused by twisting it in long narrow bags before an open fire and the molten liquid is squeezed through the bags and spread out uniformly on porcelain cylinders. When cold these sheets are assorted according to colour, the thick pieces and impurities being punched out and cast into the bags for remelting. To produce *buttonlac*, the molten lac is dropped on to a smooth surface instead of being stretched. The only other commercial forms of lac which need be noticed are *garnetlac*, which is a dark red lac made from Assam or Burma sticklac by the spirit or wet process, usually with about 10 per cent rosin, but without orpiment, *tongue lac*, and *kiri*, the residue remaining in the bags after melting. Button and tongue lac are usually made from medium to good quality sticklac, while shellac is made in all grades.

In India there is a considerable demand for *kiri* in connection with the manufacture of bangles, bracelets, toys and articles of domestic utility, the ornamentation of ivory and metalware, or as a cement.

Exports.

Repeated attempts to cultivate lac in Japan, Formosa and German East Africa having proved fruitless and the produce of Siam and Indo-China together being only 2½ per cent. of that of India the latter enjoys a practical monopoly of the trade. In the table below the general rise in world prices is reflected in the enhanced value of the exports during the last two years.

TABLE No. 163.—*Exports of lac by sea from British India to foreign countries from 1913-14 onwards.*

MANUFACTURED.

Year.	Shellac.		Buttonlac.		TOTAL.		Average value per cwt.
	Cwts.	£	Cwts.	£	Cwts.	£	£
1913-14	275,357	1,131,875	21,865	87,139	297,222	1,219,015	4·2
1914-15	307,845	940,979	25,526	83,135	333,371	1,024,115	3·0
1915-16	358,661	1,031,589	12,610	38,177	371,271	1,069,766	2·8
1916-17	324,284	1,033,599	3,109	12,991	327,393	1,713,257	5·2
1917-18	289,676	2,394,317	2,759	28,282	292,435	2,422,599	8·2
1918-19	222,889	1,866,263	3,520	37,533	226,409	1,903,793	8·4

TABLE No. 164.—*Exports of lac by sea from British India to foreign countries from 1913-14 onwards*—concld.

UNMANUFACTURED.

Year.	Sticklac.		Other kinds.		TOTAL.		Average value per cwt.
	Cwts.	£	Cwts.	£	Cwts.	£	£
1913-14	1,196	3,449	40,743	88,069	41,939	91,518	2·2
1914-15	1,229	2,713	32,192	43,667	33,321	46,380	1·4
1915-16	3,519	7,612	42,530	67,675	46,049	75,288	1·6
1916-17	7,459	23,456	46,497	132,066	53,956	155,522	2·8
1917-18	1,504	7,596	28,481	88,386	29,985	95,936	3·2
1918-19	4	26	12,686	61,817	12,690	61,843	4·9

Government control.

When the war had been some time in progress it became necessary in order to secure sufficient supplies for the Ministry of Munitions (whose annual requirements for the United Kingdom and the Allies were estimated at 50,000 cwts.), to come to an agreement in January 1917 with the shellac shippers in Calcutta, whereby the shipment of lac was prohibited to all destinations, but licenses were freely given on condition that against every export on private account a consignment of shellac corresponding to 20 per cent. of the quantity exported and of a certain specified quality, was guaranteed to Government at a fixed *f. o. b.* price of Rs. 42 per maund. Owing to the difficulty of obtaining sufficient quantities of the Government quality, the Ministry of Munitions eventually agreed to take a certain portion of their requirements in commercial T. N. London standard. In the matter of export of other qualities of lac, the Government percentage was calculated on the assumed percentage of shellac in each variety, *viz.*, 90 per cent. in the case of seedlac, 70 per cent. in that of sticklac and 40 per cent. of refuse lac, giving 18 per cent., 14 per cent. and 8 per cent. as the proportion due to Government in respect of each. Through the co-operation of the shellac shippers this scheme worked very successfully and resulted in the supplying of 80,000 cwts. to the Ministry of Munitions. Shortly after the suspension of hostilities it was discontinued and the restrictions on export were also removed, but nevertheless shipments from India in 1918-19 were not particularly heavy owing to railway congestion between the manufacturing districts and Calcutta and to a markedly small *bysaki* crop in 1918.

The distribution of the exports in the last pre-war year and in 1918-19 is shewn in the following table.

TABLE No. 165.—*Distribution of exports of lac in the years 1913-14 and 1918-19.*

Country.	1913-14.		TOTAL.	1918-19.		TOTAL.
	Manufactured.	Unmanufactured.		Manufactured.	Unmanufactured.	
	Cwts	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.
United States of America.	130,968	22,461	153,429	100,196	8,039	108,229
United Kingdom	91,160	6,609	97,769	67,376	4,104	71,480
Germany . .	41,582	11,182	52,764	...	...	...
France . .	12,202	81	12,283	9,796	539	10,335
Other countries	21,310	1,606	22,916	49,041	8	49,049

With a growing demand all over the world especially from the United States of America, where extensive use is made of it in the manufacture of gramophone goods, varnishes, lithographic ink and for insulating purposes in the electrical industry, there is little doubt that the special war demands for shellac will, before long, be fully made good in other markets.

Lac dye.

Exports of lac dye have for several years practically ceased though crude cake dye continues to be sold in the bazaars. Against 18,000 cwts. recorded in 1868-69 only 18 cwts. were exported in 1910-11. Lac dye gives a fast bright red tint to silk and wool, and if supplies were available in a reasonably pure state should command a considerable market.

Lac wax.

Lac wax is in demand in connection with boot polish but is not usually separated from the resin in the treatment of sticklac, as it is believed prejudicially to affect the quality of the resultant shellac. No separate statistics are maintained of the exports of lac wax.

Imports.

Imports of lac into India are on a comparatively small scale and are practically limited to sticklac from Siam and Indo-China *viâ* the Straits Settlements, for conversion into shellac, averaging about 10,000 cwts. yearly.

Marks and standards.

The major portion of the lac that leaves India is in the form of a dark orange shellac known as T. N. (formerly the mark of a firm called Tularam Nataram) and is mainly derived from *palas* sticklac. In London each year a sample representing the average quality of the lots of common shellac arriving from India is standardised and quotations are made on the T. N. basis, the T. N. quotation being the medium of speculation in both markets.

In the United States T. N. (corresponding to London T. N.) 3 per cent. refraction* is allowed but the N(ew) Y(ork) T. N. and 'superfine' grades must be pure and a penalty is imposed by the shellac Importers' Association in the case of shellac containing more than 5 per cent. rosin.

* *i.e.*, impurity.

A similar step was taken by London in 1904 when rosin admixture was restricted to 3 per cent. for shellac and 10 per cent. for garnet lac, but no restrictions are in force against the import of private marks containing higher percentages of adulteration. In certain industries pure shellac is not required. Rosin is added to lower the melting point, and few of the shellacs exported can be said to be entirely free from it. Orpiment (yellow sulphide of arsenic) is also added where the trade demands an opaque pale coloured shellac.

As a stiffening for silk hats shellac with as much as a 10 per cent· admixture of rosin is acceptable, but for other purposes so much rosin would be treated as adulteration. Calcutta shellac contracts contain a clause guaranteeing not more than a certain percentage of rosin and other impurities, the penalty being 8 annas per maund for every unit per cent. up to 4 per cent. above the allowed amount and Re. 1 per maund for every unit in excess.

Organisation of the trade.

The lac trade like so many others in India is encumbered by the large number of middlemen who intervene between the actual collector and the manufacturer or shipper. By a system of advances, the collector of sticklac and the small manufacturer are bound to *banias* or middlemen to whom alone they can sell, and brokers again intervene at the port of shipment. Shellac is usually sold on drafts of 3 months' sight for shipments to Europe and of 4 months' sight for the United States of America against letters of credit in London. Contracts are on a *c. i. f.* basis to Europe but in the case of America only *c. f.*, as insurance is usually arranged by the importers themselves. Occasional shipments are also made on consignment sale.

Shellac is packed for export in two maund cases (one maund=$82\frac{2}{15}$ lbs.) which weigh approximately $1\frac{1}{2}$ cwts., or in double gunnies. The local unit of sale is the bazaar maund, but for export the cwt. in the case of shipments to the United Kingdom, and the lb. for the American market.

The following table shews the preponderating share in the export trade enjoyed by Calcutta, even before the war.

TABLE No. 166.—*Exports of lac from British India (principal ports and percentage) in 1913-14.*

Ports.	Quantity.	Percentage.
	Cwts.	
Calcutta	328,892	96·9
Rangoon	4,068	1.3
Karachi	3,664	1·0
Bombay	1,296	·4
Madras	1,240	·4

In 1918-19, Calcutta's share is represented by the percentage figure of 96·5, with total exports aggregating 240,000 cwts. valued at £1,965,640.

Before the war there were occasional shipments chiefly of seed lac to the United States of America, which purchased in this market when the margin between the prices for India and Burma lac was appreciable. Over 7,500 cwts. went to the United States of America in 1912-13. The overland imports from 1912-13 onwards into Burma which constitute the bulk of what is known commercially as Burma lac, is shewn in the table below.

Burma.

TABLE No. 167.—*Overland imports of lac into Burma from 1912-13 onwards.*

Year.	Western China.	Shan States.
	Cwts.	Cwts.
1912-13	1,007	16,542
1913-14	2,200	9,164
1914-15	1,448	2,200
1915-16	1,934	11,982
1916-17	2,774	15,324
1917-18	4,247	12,728
1918-19	3,402	12,391

In 1912-13 there were in addition nearly 18,000 cwts. from Karenni. There is only one company in Burma engaged in shellac manufacture and the quantity of sticklac exported coastwise to Calcutta for conversion into shellac amounted in 1916-17 to 24,000, in 1917-18 to 16,000 cwts. and in 1918-19 to 19,000 cwts. A royalty is levied by the Local Government on exports of sticklac and manufactured lac from Burma at the rate of Rs. 3 and Rs. 4 per cwt. respectively.

COFFEE.

Coffee is derived from a rubiaceous plant belonging to the same family as cinchona and *madder*. The bulk of the coffee grown in India is *coffea arabica*, but there has been some experimental cultivation of *coffea robusta* and of a cross between *arabica* and *liberiana*.

History of coffee growing in India.

According to tradition Baba Budan returning from a pilgrimage to Mecca in the 16th century brought seven seeds and planted them on the hills now called after him in the Kadur district of Mysore, but the systematic cultivation of coffee in India dates only from 1830 when Mr. Cannon opened a plantation near Chickmugalur, and during the next 30 years a large area was put under coffee not only in Mysore but also in Coorg, the Nilgiri and Shevaroy Hills and the Wynaad. In 1862 the coffee industry in Southern India had reached its zenith, but three years later the borer beetle made its appearance in the Wynaad and Coorg, and the leaf blight (*hemileia vastatrix*) which had ruined the Ceylon coffee estates followed. Between 1877 and 1887 no less than 263 plantations in the Wynaad were abandoned and the Ceylon industry was completely ruined, but the Indian industry, if it has made no headway in the last

thirty years, has at least lost little ground, despite falling prices due to the competition of Brazil, Guatemala and Costa Rica chiefly because the produce is generally of superior quality. Indeed the coffee from certain Mysore estates commands higher prices than even the so-called Mocha, much of which, if the truth were known, being Native cherry exported by *dhow* from Mangalore and Tellicherry to Red Sea ports. When railway communication between the estates and the coast is established, the heavy cost of transport by cart with the attendant risk of theft will be obviated to the advantage of the industry. The acreage under coffee cultivation in India in the latest year for which figures are available is given below.

TABLE No. 168.—*Area under coffee in India in 1917-18.*

Provinces.	Area in acres.
Mysore State	108,176
Madras Presidency	52,683
Coorg	42,491
Cochin	5,922
Travancore	1,288
Burma	85
Bombay Presidency	49
TOTAL	210,694

The yield of coffee varies considerably according to the season and the estate. On the best plantations in a good season as much as 12 cwts. to the acre has been recorded, but 400 lbs. of clean coffee per acre may be taken as a fair average yield. The bulk of the coffee produced in India is exported, the most important markets being the United Kingdom and France. Coffee estates give employment to about 35,000 persons permanently and 46,000 temporarily every year. The crop begins to ripen in October and hand-picking continues until January. The berries which have fallen on the ground and are collected at the end of the season are known as *jackal* coffee. The ripe coffee bean or *cherry* consists usually of two seeds or berries, but in a certain percentage is found only one, which on account of its shape is distinguished by the name of *peaberry*. After plucking, the fruit is either dried and pounded or immersed in water and pulped by the wet method before it is bagged and sent down to the coast. The outer covering is known as the *pulp* and the inner adhesive layer as *parchment*, while the seed coat within the parchment is the *silver skin*.

Coffee curing.

Some coffee is sent in parchment direct to Europe, but the bulk of the coffee grown in Mysore, Coorg and the Wynaad, the Nilgiris, Palni and Shevaroy Hills is prepared for export at Mangalore, Tellicherry, Calicut and Coimbatore. Altogether there are sixteen large curing works employing about two hundred men and women apiece. The parchment coffee which is brought down to the coast in carts is spread out on barbecues which consist of asphalt platforms in open yards slightly sloped from the centre

and divided by low slanting barriers. When sun-dried the coffee is taken into the peelers, and after peeling winnowed by either machinery or hand labour, and sized. It is then garbled by women who eliminate all the broken and imperfect beans. When the garbling is over the coffee is weighed and is then bagged in double sacks or put into casks. Commercially two kinds of coffee are recognised, (1) *cherry*, usually from Indian-owned estates, where the whole fruit is dried and not put through pulpers, and (2) *plantation* coffee, cured at the coast ports according to the process already described. Most of the cherry goes to France and of the plantation coffee to the United Kingdom. The three recognised sizes are known as A, B, and C, exclusive of peaberry, while the broken and imperfect beans are classified as *triage*. Typical pre-war prices were Rs. 50—60 for *plantation* and Rs. 40—50 for *native cherry f. o. b.*, West Coast ports; or 80 and 70 shillings respectively *c.i.f.*, London. When bagged, coffee is put up in gunnies containing 182 lbs. nett, and shipment is usually effected between December and March but may be extended to May. In the following table are shewn the quantities and values of coffee exported from 1913-14 onwards.

TABLE No. 169.—*Quantities and values of coffee exported from India from 1913-14 onwards.*

Year.	Quantity.	Value.	Average value per cwt.
	Cwts.	£	£
1913-14	259,900	1,024,402	3·9
1914-15	290,394	1,102,515	3·7
1915-16	176,685	657,955	3·7
1916-17	197,763	717,837	3·6
1917-18	195,546	662,037	3·3
1918-19	218,504	795,856	3·6

In the next table are shewn the quantities of coffee shipped from each of the principal ports and the proportionate share of each in the last pre-war year. It will be seen that the trade is practically confined to Southern India.

TABLE No. 170.—*Distribution of the trade in coffee among principal ports in 1913-14.*

Ports.	Quantity.		Percentage.	
	Cwts.			
Madras Presidency—				
Mangalore	115,820	257,375	44	99
Tellicherry	92,655		36	
Calicut	41,180		16	
Tuticorin	5,150		3	
Bombay Presidency—				
Bombay	2,439		·9	

In 1917 it was found necessary to restrict the exports of coffee, and the suggestion of large purchases by the military authorities for the troops in the eastern theatre of war as an alternative to tea provoked so much opposition that it was not persevered in. A feature of the 1918 shipping season was the purchase of 2,000 tons by the Greek Government, for which freight was found in a Greek vessel. In the current season (1919) a second contract for 3,500 tons was entered into, of which over 1,600 tons had been shipped by the end of March.

TIMBER.

The Indian forests are a source of considerable profit to the State, yielding a net revenue in 1917-18 of rather more than one and a quarter million sterling. The area covered by forests under the control of the Forest Department in India exceeds a quarter million square miles of which 100,000 square miles have been brought under regular management and systematically conserved and worked in 1916-17 by the Imperial Forest Service.

The annual outturn of timber and fuel from Government forests may be roughly estimated as five million tons, of which over 366,000 tons are teak (*tectona grandis*) from Burma forests. Other important timbers extracted include deodar (*cedrus deodara*), sal (*shorea robusta*), shisham (*dalbergia sissoo*), rosewood (*dalbergia latifolia*), eng (*dipterocarpus tuberculatus*), cutch (*acacia catechu*), padauk (*pterocarpus macrocarpus*), pyinkado (*xylia dolabriformis*), sandal (*santalum album*) and casuarina (*casuarina equisetifolia*). Artificial plantations cover over a hundred thousand acres, perhaps the most important, apart from rubber, being the teak plantation at Nilambur in the Malabar District of the Madras Presidency (started in 1842), and the numerous coupes for fuel purposes of casuarina, eucalyptus and deodar.

Exports.

The foreign exports of timber are practically confined to those of teak which is exported chiefly from Burma. In 1913-14 the exports from Rangoon amounted to 42,406 cubic tons valued at £426,200 and from Moulmein 6,122 cubic tons valued at £65,300. The United Kingdom took 27,416, and Germany 6,282 tons. Owing to the increasing scarcity of supplies, prices had been rising for several years past and stocks growing depleted. The coastwise exports were from Rangoon 78,763 cubic tons valued at £493,400, and from Moulmein 34,328 tons valued at £251,400.

The foreign trade has been dislocated by the war, and in 1916-17 exports from Burma had declined to 23,944 cubic tons valued at £304,300 from Rangoon and 74 cubic tons valued at £733 from Moulmein, but owing to increased demands for military and building purposes from India proper, the coastwise exports totalled 145,518 cubic tons valued at £1,109,600. A certain amount of teak from Siam forests close to the Burma frontier is floated down the Salween River to the timber yards at Moulmein and is re-exported from there. The total quantity

so brought down rose from 7,153 cubic tons in 1917-18 to 17,549 tons in 1918-19. The foreign exports of timber other than teak from Burma are comparatively small but considerable quantities of *eng* and *pyinkado* *are shipped in normal times to Bombay and Calcutta.*

The exports from Burma on Government account during the last two years of the war amounted to nearly 150,000 tons. A good deal of the teak went to Mesopotamia, and other theatres of war supplied with scantlings, etc., were Salonika and East Africa.

The quantity and value of timber exported from 1913-14 onwards are shewn in the table subjoined.

TABLE No. 171.—*Quantity and value of exports of timber from 1913-14.*

Year.	Quantity.	Value.
	Cubic tons.	£
1913-14	58,672	571,636
1914-15	47,347	579,531
1915-16	36,025	420,866
1916-17	28,270	334,876
1917-18	16,504	215,999
1918-19	33,313	423,390

Imports.

Apart from Siam and Java teak imported in considerable quantities into Calcutta there have always been large quantities of comparatively cheap foreign timber coming into India for various purposes, such as furniture, packing cases, etc. Wooden railway sleepers imported on Government and private account, which are registered under a separate statistical head have been included in the next table for the sake of completeness. Of the cheaper timbers the principal are Oregon pine imported from America and, before the war, jarrah wood from Australia.

TABLE No. 172.—*Imports of timber including railway sleepers into India from 1913-14.*

Year.	QUANTITY.		TOTAL VALUE.
	Timber.	Railway sleepers.	
	Cubic tons.	Cwt.	£
1913-14	96,148	1,090,063	765,911
1914-15	76,700	1,575,180	879,076
1915-16	70,425	140,057	469,621
1916-17	86,256	59,·76	673,192
1917-18	79,916	25,998	762,896
1918-19	36,780	*Nil*	431,817

There are about a hundred saw mills in Burma of which ten are of considerable size, eight in Assam, two in Bombay, one at Chanda in the

Central Provinces and three in the Madras Presidency, the biggest being at Kallai near Calicut employing 450 operatives.

Unit of sale.

The unit of sale in the case of timber is usually the cubic foot, the method of measurement employed being known as the Hoppus (*i.e.*, length × square of ¼ girth) which governs all transactions in round timber in Burma. Fifty cubic feet of timber go to the cubic ton.

SANDALWOOD.

Occurrence.

East Indian sandalwood is the heartwood of *santalum album*, an ever green tree whose occurrence is practically limited to a restricted area in Southern India, chiefly in Mysore and Coorg and the Coimbatore and Salem districts in the Madras Presidency.

Sandalwood is mentioned in ancient Sanskrit literature and, long before the exploitation of the East by European traders, was a principal article of commerce. The heartwood (equivalent to about one-third of the felled tree by weight) is employed in the manufacture of small caskets and picture frames and for carved work in general. Considerable quantities are also utilized for religious rites and ceremonies. Hindus all over India smear sandal paste on their foreheads and upper parts of the body, and the wealthier burn billets of it when cremating their dead. The wood is also used in the fire temples of the Parsees. The oil content of the heartwood varies from 5 to 7 per cent. This essential oil has valuable medicinal properties and considerable use is also made of it in perfumery and in the manufacture of superior toilet soaps. The local demand of sandalwood for these various purposes has been estimated at between 500 to 600 tons annually out of a total of 2,750 tons coming commercially into sight in pre-war times. During the war this total has fallen to about 2,050 tons, but the seaborne trade returns shew only the export values and not the weights, and the former cannot safely be compared with the figures furnished by the auction sales as they probably include the cost of carriage to the port, handling charges and the exporter's profit.

Production and sales.

In Mysore and in Coorg all the trees are State property, and in Madras, though private ownership is recognised, production is almost a monopoly of the Government Forest reserves. All wood collected during the year in the three provinces was formerly sold by public auction, the average quantity thus disposed of ranging between 2,500 and 3,000 tons annually. In 1908-09, Mysore disposed of 2,114 tons valued at £70,000 and in 1911-12, 2,363 tons valued at £84,000. At the sales held at the end of 1912 (for statistical purposes 1912-13), indication of a powerful competitor having entered the market was revealed by the disposal of 2,418 tons for £151,200 and these greatly enhanced values were more than maintained in the following year. It is now known that the enhancement

in the rates offered for sandalwood in 1912 was entirely due to competition on behalf of German buyers, who were either desirous of accumulating stocks against the day believed to be not far distant when the market could be closed to them by war, or had set themselves out to obtain a virtual monopoly of the supply of East Indian sandalwood for distillation purposes. With this competition eliminated, the auctions at the end of 1914 proved a complete fiasco, though some small sales were effected early in 1915 at prices almost up to pre-war level and at the next auction 2,000 tons were disposed of for £113,300 owing to American purchases, partly it is believed, on German account. Before the auction took place in the following year, the Bangalore factory had opened and the Mysore Government materially enhanced the upset price. Though only 1,347 tons were sold, no less than £153,300 were realized, which reflects the rapid rise in the price of sandalwood oil on the London market. Since then auctions have been suspended. The quantity sold in Madras is not separately recorded but values have steadily appreciated from £10,000 in 1913-14 to £35,000 in 1917-18. Coorg had a very bad set-back in 1914-15 when only 32 tons valued at £1,660 were disposed of, but 380 tons were disposed of in 1915-16 for £23,330, and in 1917-18, when Mysore competition was for the first time eliminated, 300 tons realized rather more than £35,000. The average price per ton realized at auction nowhere much exceeded £33 before 1912, when buyers acting on behalf of Messrs. Schimmel raised it to over £60. In 1913-14 the average was £70 in Mysore and £66 in Coorg. The disappearance of enemy buyers affected quantities to a much greater extent than values but the resultant average in 1915-16, when the German offensive was resumed behind a neutral screen, was only £56 in Mysore and £60 in Coorg. In 1916-17 the averages were £114 and £105 respectively and Coorg topped the Mysore figure in the following year. If the Madras and Coorg Administrations suspend their auctions of the wood also and come to an arrangement with the Mysore Darbar for the distillation of oil on their behalf, a practical monopoly of the product should be effected as the sandalwood of Western Australia (*Jusanus spicatus*) and of the Malay Archipelago have a much lower oil content.

Sandalwood oil.

The extraction of oil by crude methods is one of the oldest indigenous industries in India, the principal centre being Kanauj in the United Provinces where by primitive and wasteful processes costly *attars* and perfumeries are still produced. Though there are a number of small distilleries in the adjoining Madras districts, distillation was long prohibited in the Mysore State; but the collapse of the demand for the wood after the outbreak of the war led Sir Alfred Chatterton, Director of Industries in Mysore, to carry out experiments for the distillation of the oil, and in May 1916 the first factory was opened at Bangalore under State management with a producing capacity of 2,000 lbs. a month, at a most favourable time when the price of sandalwood oil in London was increasing at every sale. In the table below are shewn the prices of East Indian sandalwood oil from July 1914 onwards.

TABLE No. 173.—*Prices of East Indian sandalwood oil from July 1914 onwards.*

Year.	Shillings.
1914—	
July	21
August	23
December	23
1915—	
Lowest	21½
Highest	30
1916—	
Lowest	31
Highest	45
1917—	
Lowest	47½
Highest	53
1918—	
January	52½
July	52½

Distillation on a large scale in India involves a not inconsiderable reduction in freight requirements as every ton of wood yields on an average 100 lbs. of oil, the weight of which packed is only a tenth of the wood itself. The monthly capacity of the factory at Bangalore has since been enlarged to 6,000 lbs. whilst a second factory with an ultimate capacity of 20,000 lbs. a month started work in August 1917 in Mysore. Up to 31st December 1918, these two factories had together dealt with 2,113 tons of sandalwood yielding 212,371 lbs. of oil, of which about 196,000 lbs. have been disposed of. In 1917-18 the sales of oil brought in £183,300 to the Mysore State.

The values of the exports of sandalwood and sandalwood oil from 1913-14 onwards have been as follows. The principal ports of export of the wood in pre-war times were Mangalore, Tellicherry, Calicut and Cochin. The oil is generally shipped from Madras, Mangalore, Calcutta and Bombay.

TABLE No. 174.—*Values of sandalwood and sandalwood oil exported from 1913-14 onwards.*

Year.	Values.	
	Sandalwood.	Sandalwood oil.
	£	£
1913-14	128,626	..
1914-15	35,918	..
1915-16	103,795	..
1916-17	130,351	54,823*
1917-18	52,347	145,713
1918-19	10,529	227,563

* Calcutta not included as statistics are obtainable only from November 1917.

The principal destinations for the wood in pre-war days were as indicated in the table below. Since the declaration of war the United Kingdom and the United States of America have between themselves appropriated more than 75 per cent of the quantities shipped, and Japan has also increased her demands.

TABLE No. 175.—*Distribution of the trade in sandalwood among importing countries in 1913-14.*

Destinations.	Percentage.
Germany	43·4
United Kingdom	21·7
United States of America	15·5
France	7·7
Holland	3·1
Ceylon	·4
Egypt	3·8
Japan	·3

The major portion of the consignments of Mysore oil went exclusively to the United Kingdom but recently a good market has developed in Japan whose imports rose from 1 gallon in 1916-17 to 352 in the following year and 4,231 in 1918-19. The distribution of the trade in oil in 1918-19 is shewn in the next table.

TABLE No. 176.—*Exports of sandalwood oil in 1918-19 shewing the share of the principal recipients.*

Destinations.	Quantity.	Value.
	Gallons.	£
United Kingdom	10,151	155,013
Japan	4,231	61,986
France	374	7,284
Hongkong	87	1,588
Java	59	190
Egypt	48	859
Australia	23	463
Straits Settlements and Federated Malay States	9	134
Other countries	3	46
TOTAL	14,985	227,563

Every consignment of sandalwood oil from the Mysore Government factories is covered by a certificate of quality from Messrs. Sudborough and Watson of the Indian Institute of Science, Bangalore, ensuring the shipment of only the highest grade of oil.

Imports.

There are some imports, chiefly into Bombay, of Australian sandalwood (*fusanus spicatus*) and sandalwood from the Dutch East Indies *viâ* Singapore for religious and ceremonial purposes.

The units vary at the different West Coast ports. In Mangalore the wood is sold per candy of 5 cwts. and shipped in bags weighing 6 qrs., whereas in Calicut and Tellicherry sales are made per cwt. and shipment takes place in bundles of 1½ to 2½ cwts. The unit of sale of the oil in Mangalore is the seer of 24 tolas, shipment being made in copper pots of 3 qrs. each. In Madras and in Calcutta it is sold by the lb. and shipped in tins packed in cases varying in weight from 48 to 60 lbs. at the latter port and 100 lbs. at the former.

Unit of sale and shipment.

DYEING AND TANNING SUBSTANCES.

Myrobalans.

Myrobalans, the commercial name indiscriminately applied to the fruit of *terminalia chebula*, *terminalia belerica* and *phyllanthus emblica*, which are widely distributed over India, are a valuable tanning agent. Considerable difference exists in the percentage of tannin contained in the dried fruit. The best qualities are oval and pointed and solid in structure while the less valuable are round and spongy. On the English market there are five chief kinds recognised, called after the localities where they are marketed: *Bimlies* shipped from Bimlipatam in Madras, *Rajapores* and *Vengurlas* from Bombay, *Jubbulpores* from the Central Provinces, and *Madras*. On the London market *Madras No. 1 whole nuts* used to command the highest price, while tanners held different opinions as to the relative value of *Bimlies* and *Jubbulpores* which are abbreviated and referred to as B1 or J2, the figure representing the quality.

Trade descriptions.

The fruits are generally picked over for shipment and contracts made on the basis of fair average of season, the unit of sale in Madras being the candy of 500 lbs. and of packing the bag of 164 lbs. nett. In Calcutta the nuts are shipped in ½ cwt. pockets and sales are made per bazaar maund, while in Bombay the unit of sale is the candy of 25 Bombay maunds and shipment is made in bags of 140, 168 and 182 lbs.

Unit of sale and shipment.

High freights should encourage increased shipments of crushed myrobalans, *i.e.*, with the kernels removed, and myrobalan extract. The concentrated extract containing 50 to 60 per cent. tan is usually shipped in solid blocks. Shipments of the extract in 1918-19 from Calcutta aggregated 1,900 tons valued at £38,000. The extract is packed for shipment in bags or cases weighing about one cwt. each.

Myrobalan extract.

In the following table will be found the quantity and value of myrobalans exported during the last six years.

Exports.

TABLE No. 177.—*Quantity and value of myrobalans exported from 1913-14 onwards.*

Year.	Quantity.	Value.
	Tons.	£
1913-14	61,819	379,626
1914-15	58,213	350,450
1915-16	69,633	470,157
1916-17	54,681	418,895
1917-18	40,778	315,303
1918-19	41,195	328,936

In Calcutta the season for shipment runs from December to June. The chief markets before the war were the United Kingdom, Germany, the United States of America, Belgium, France and Austria-Hungary, though the exports to the United Kingdom were diminishing and those of the Central Powers and Belgium increasing. Of the total exported in 1913-14 32,652 tons went from Bombay, 23,500 from Bengal and 5,667 from Madras. There is a large coast-wise trade in Western India chiefly from smaller ports such as Vengurla in the Ratnagiri district into Bombay itself.

Indigo.

History of cultivation.

Indigo is the produce of several species of plants belonging to the genus *indigofera*, especially *indigofera arrecta*, *tinctoria* and *sumatrana*, which yield the well known dark blue dye of commerce. Until 1907-08 indigo represented more than half the total value of dyeing and tanning materials exported. This percentage had fallen to one-fifth in 1913-14, but had recovered its old position the following year. The historical record of indigo goes back almost to the beginning of the Christian era and the process of manufacture is described by many early travellers to India. Originally the industry in Western India was in Portuguese hands, but about 1778 the East India Company revived it in Bengal and gave it direct encouragement for the next twenty years, and when about 1837 the industry migrated to Tirhoot and the United Provinces, India recovered the foremost place among indigo producing countries of the world from which she had been temporarily ousted by the West Indies. India's position remained unassailed though there was cultivation also on a considerable scale in Java, until German laboratories, thanks to an accident, found themselves in 1897 at last in a position to produce indigo (which had actually been synthesized nearly thirty years earlier) on a commercial scale. The fate which had already overtaken the *madder* and lac dye industries thereupon threatened the factories of Bihar. A decline in the exports of natural indigo from India (and also in Java) began almost immediately, and though at one time it was hoped that the introduction of the Natal-Java plant (*indigofera arrecta*) giving a higher

yield of indigotin with improved methods of cultivation and extraction might stem the tide, this retrogression proceeded steadily until the declaration of hostilities in 1914 closed the markets of the world to the synthetic substitute. By 1910 the Java industry was dead, and in 1913-14 the area under cultivation in India was scarcely more than a tenth of that in 1895-96.

Prices.

Soon after the outbreak of war the shortage of dye stuffs among the Allies (except perhaps in Japan) became acute, and in India when the Calcutta indigo sales were resumed in December, prices were nearly four times as great as those realized in the previous March. The range of prices from the last pre-war season onwards is shewn in the table below.

TABLE No. 178.—*Prices of indigo in Calcutta from the last pre-war year onwards.*

Months.	Price per cwt.				
	1913-14.	1914-15.	1915-16.	1916-17.	1917-18.
	£ s.	£ s.	£ s.	£ s.	£ s.
December	17 8	67 8	62 8	67 8	30 0
January	17 8	70 8	62 8	67 8	32 8
February	17 8	70 0	62 8	62 8	32 8
March	17 8	67 8	65 0	61 4	32 8

Area and production.

With this encouragement to exporters and with the Indian dyers finding supplies of aniline increasingly difficult to obtain, and then only at extravagant rates, the area under cultivation increased by over 100 per cent. in 1915-16 and again by another 100 per cent. in the following year. But even then the total was less than half the high water mark reached twenty years before, and the output was scarcely proportionately raised as the increase in cultivation was chiefly in Madras and the United Provinces where, owing to the dye being manufactured in more primitive fashion, the outturn is generally lower than in Bihar. The dye shortage in the United Kingdom led to the reopening of the Badische branch works at Ellesmere Port for the manufacture of aniline and alizarine dyes, as soon as the secrets of manufacture had been re-discovered by English chemists, and when Germany is once more in a position to export her dye stuffs freely, the competition of the synthetic substitute with natural indigo will become even more acute than before. In 1917-18 there was a fall in the acreage under the plant, and a marked fall in prices, and in 1918-19 these elements of weakness became even more accentuated. The following table shews the total area under indigo, the estimated production and exports in 1894-95, 1896-97, 1897-98, 1898-99, 1904-05, 1912-13, and from 1912-13 onwards.

TABLE No. 179.—*Area, yield and exports of indigo from 1894-95 onwards.*

Year.	Area.	Yield.	Export.
	Acres.	Cwts.	Cwts.
1894-95	1,688,042	237,449	166,308
1896-97	1,688,901	168,673	169,523
1897-98	1,339,099	166,812	133,849
1898-99	1,010,318	139,320	135,187
1904-05	476,900	58,900	49,252
1912-13	220,100	39,100	11,857
1913-14	172,600	26,800	10,939
1914-15	148,400	25,200	17,142
1915-16	353,100	55,100	41,932
1916-17	770,000	95,700	34,230
1917-18	710,600	88,300	31,062
1918-19	300,700	44,100	32,707

The area and production in the various provinces at the outbreak of war are given in the next table.

TABLE No. 180.—*Area and yield of indigo in each province according to the forecast in 1914-15.*

Provinces.	Area.	Production.
	Acres.	Cwts.
Madras	71,700	13,600
Bihar and Orissa	38,500	5,500
Punjab	20,400	3,400
United Provinces	12,300	1,500
Bombay and Sind (including Native States)	4,200	600
Bengal	1,300	200
TOTAL	148,400	25,200

It will be seen that the largest area was in Madras where (as in the Punjab and the United Provinces) it is for the most part cultivated in small holdings and the inferior dye produced largely disappears in local consumption, though there has always been a definite market for the better grades particularly in the Levant. There is also an appreciable but not definitely ascertainable area under indigo in Travancore where *indigofera longiracemosa*, for which a high indigotin yield is claimed, has recently been re-discovered.

The Bihar crop usually comes on the market in December and the export season completed before the end of the statistical year, while the Madras season for the best grades runs from July to February. The trade names for the two principal varieties of indigo sold on the Calcutta market are *Bihar cake* (also known as *Bengal and Tirhoot*) and *Oudh and Benares*, while the Madras indigo for which occasional quotations are made is known as *kurpah*.

Exports.

The province which contributed chiefly to the foreign export trade before the war was Bihar where the dye is more systematically extracted and marketed

under European supervision. The bulk of the indigo produced in the factories of Bihar is in normal years exported and the Calcutta trade returns are a very fair gauge of the total production of that province. When in 1894-95 237,449 cwts. were produced from 1,688,042 acres, 106,830 cwts. were exported from Calcutta and in the last pre-war year the all-India exports amounted to 10,939 cwts. when 8,752 cwts. came from the factories of Bihar.

The following table shews the distribution of the export trade among the principal ports concerned.

TABLE No. 181.—*Share of the principal ports in the exports of indigo from 1912-13 onwards.*

Ports.	1912-13.	1913-14.	1914-15.	1915-16.	1916-17.	1917-18.	1918-19.
	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.
Calcutta .	9,229	8,752	9,897	13,137	13,614	18,519	18,040
Madras .	2,065	1,787	5,393	26,171	12,280	3,411	10,246
Bombay .	320	173	1,426	2,565	8,102	8,922	4,281
TOTAL .	11,857	10,939	17,142	41,932	34,230	31,062	32,707

The feature of the export trade in 1915-16 was the heavy shipment from Madras, greatly in excess of those from Bihar, which went chiefly to the United Kingdom but also to Egypt, Persia and the United States of America.

China and Japan have always been by far the largest markets for synthetic indigo, their combined consumption in 1913 (on a basis of 20 per cent. paste) being 27,000 tons out of an estimated exportable surplus from Germany of 47,000 tons. In the same year the United Kingdom, British Possessions and the United States together took little more than 6,000 tons. Into these Far Eastern markets India scarcely penetrated in her heyday, owing to the competition of primitive indigenous manufacture, and showed little sign of capturing them in the more favourable conditions created during the war, although the resuscitation of the Indian industry should depend largely upon its successful exploitation of the China and Japan trade.

Indigo cess.

In 1918 by an Act of the Imperial Legislature, an indigo cess has been imposed at the rate of one rupee per bazaar maund (of $82\frac{2}{15}$ lbs. avoirdupois) on all Indian indigo exported, the proceeds of the duty to be expended by the Government of India for scientific research work in connection with the cultivation and manufacture of indigo. A corresponding cess has been imposed on all exports from Travancore to ports outside British India or to Aden. Investigations are now being conducted at the Pusa Research Institute by the Indigo Research Chemist to the Government of India and the expenses of the London Indigo Committee will also, it is anticipated, in future be met from the proceeds of this cess.

Prices are quoted in Calcutta at so many rupees *f. o. b.* or pounds *c. i. f.* sterling per ℔ for London, the unit in the local bazaar being the factory maund of $74\frac{2}{3}$ lbs. The paste is shipped in cases containing 4 or $4\frac{1}{2}$ maunds each.

Unit of sale and shipment.

The unit of sale in Madras is the maund of 25 lbs., but the unit of shipment varies according to destination. Egypt requires cases weighing from 80 to 90 lbs. nett, Japan 150 lbs. gross, while indigo to Europe goes in cases weighing 250 to 300 lbs. nett.

Turmeric.

Production.

Turmeric is derived from *curcuma longa* which is extensively cultivated in India for the sake of its rhizomes, which are edible, and also yield a valuable dye. The total area under the crop was estimated some years ago to be at least 100,000 acres,* but this is probably very much under the mark. In 1902-03 the exports from India amounted to 126,000 cwts. valued at £66,666, but are generally rather lower. Next to Formosan turmeric, the Indian product commands the best prices. In pre-war days quotations on the European market fluctuated between 12 shillings and 26 shillings per cwt. The turmeric known in the European trade as *Cochin* is grown at or near Alwaye in the Travancore State. Other varieties with special quotations are known as *daisee, Masulipatam, Madras* and *Gopalpur,* while on the Calcutta market there are two descriptions, *Pabna* and *country,* of which the former commands better prices. The root is marketed as *fingers* or *bulbs*, the former being superior in quality to the latter. Five per cent. bulbs may be included in a shipment of fingers. The normal outturn per acre varies from two to four thousand lbs. of dried and cured rhizomes, and the Madras Presidency alone is estimated to produce a hundred thousand tons.

Exports.

The bulk of the trade went to Germany, France, Ceylon, the United Kingdom and Russia, the ports participating in the foreign traffic being Bombay, Madras, Tuticorin, Cochin, Calcutta and Rangoon. In the following table are shewn the quantities exported in 1913-14 and the ports from which they are shipped.

TABLE No. 182.—*Exports of turmeric in 1913-14 with the share of the principal ports.*

Ports.	Quantities.	Value.
	Cwts.	£
Bombay	49,719	44,991
Madras	20,830	14,892
Calcutta	15,854	10,465
Tuticorin	9,986	5,796
Cochin	7,003	3,947
Rangoon	2,749	1,282
TOTAL	115,027	87,450

* Imperial Gazetteer. Indian Empire, Vol. III, p. 183.

There was a decline in exports in subsequent years, only 64,000 and 67,000 cwts. being shipped in 1914-15 and 1915-16, though a revival was experienced in the following year when over 103,000 cwts. left the country valued at £105,000. In 1917-18 and 1918-19 the quantities were 77,000 and 79,500 cwts. respectively.

Unit of sale and shipment.

Shipment is made in bags containing 1¼ cwt. nett from Cochin, 1½ cwt. from Madras, ½ cwt. from Calcutta and 1½ or 1¾ cwts. from Bombay. The unit of sale in Madras is the candy of 500 lbs. and on the West Coast the candy of 600 lbs. In Bombay it is the candy of 21 Bombay maunds and in Calcutta the bazaar maund.

Cutch.

Cutch or *Khair* is derived from *acacia catechu* which is found in the Western Himalayas and in Burma. The tree is felled and the heart wood cut into little chips and boiled in a cauldron until the fluid attains the consistency of syrup when it is taken off and cooled. A ton of wood is said to yield 250 to 300 lbs. of cutch. As the trade is largely in the hands of small manufacturers and dealers no trustworthy returns are available regarding the output. In 1895-96 the total exports to foreign countries were 183,729 cwts. valued at £246,407, but since then the traffic has considerably declined. In a normal year Burma contributes a preponderating share of the whole, in which province a royalty is levied on exports at the rate of Rs. 4 per 100 viss of 360 lbs. The bulk of the consignments are usually made to the United Kingdom, other customers being France, Germany and Holland. The exports from 1913-14 onwards are shewn in the table below.

TABLE No. 183.—*Quantities and values of exports of cutch* from 1913-14 onwards.*

Year.	Quantities.	Value.
	Cwts.	£
1913-14	58,859	62,162
1914-15	62,041	69,844
1915-16	145,511	161,333
1916-17	60,295	70,904
1917-18	42,133	44,751
1918-19	58,125	77,189

Unit of sale and shipment.

The chief ports of export are Rangoon and Calcutta with the percentage shares of 95 and 4 respectively. In Calcutta prices are quoted per bazaar maund and shipment is made in cases of one cwt. gross or 84 lbs. nett. In Rangoon the unit of sale is the cwt. and shipment takes place in cases weighing 50 to 124 lbs. nett.

*Inclusive of small quantities of gambier for which no separate statistics are available.

Divi-Divi.

The divi-divi (*cæsalpinia coriaria*), is a tree introduced into India

Occurrence.

from South America about 80 years ago, the pods of which have a very high tanning content. The tree having become acclimatised in Southern India and parts of the Bombay Presidency, there was at one time considerable trade in these pods chiefly for internal consumption but this has latterly languished owing to falling prices. Foreign exports from the Madras Presidency are shewn in the following table.

TABLE No. 184.—*Quantities and values of exports of divi-divi from the Madras Presidency with the share of the principal recipients.*

Countries.	1913-14		1914-15		1915-16		1916-17		1917-18	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	Cwts.	£	Cwts.	£	Cwts.	£	Cwts.	£	Cwts.	£
United Kingdom	4,373	1,501	4,245	1,578	5,550	2,893	4,604	2,189	1,008	455
France . .	2,070	1,163	..	..	..	..	392	523	..	..
Germany . .	1,326	538	2,080	818	..	..	..	..	..	..
Belgium . .	268	86	1,739	578	..	..	..	..	..	..
Native States in Arabia	..	..	100	54	..	..	..	..	..	..

Exports in 1918-19 amounted to 3,241 cwts. valued at £1,859 and the entire quantity was taken by the United Kingdom.

The chief ports of export from Southern India are Cocanada and Madras. The unit of sale in the former port is the bag of 164 lbs. and in the latter the candy of 500 lbs. Shipment is made from Cocanada in bags of 82 to 92 lbs. nett and from Madras in bags of 100 lbs.

As in the case of myrobalans there is an increased demand for divi-divi extract from tanners in the United Kingdom in preference to unshelled nuts.

RAW HEMP.

The term hemp is used to denote the fibre of at least three important

Trade varieties.

varieties of plants, namely, *cannabis sativa*, *agave sisalana* and *crotalaria juncea* which occur in India, but so far as her export trade is concerned it is the last named known generally as *sann* hemp which ranks first in importance, while the *agave sisalana*, commercially known as *sisal* comes next. The fibre of *hibiscus cannabinus*, or *Deccan* hemp is better known perhaps as *Bimlipatam jute* from the port from which it is principally exported, and as it actually competes in certain classes of manufactures, *e.g.*, heavy C's, with the products of Bengal mills, it is classified statistically

with *corchorus* and has been dealt with already. No official forecasts of the hemp crops are published but in 1917 the Director of Statistics instituted a special inquiry to ascertain the area and estimated production in 1916-17, the results of which are tabulated below.

TABLE No. 185.—*Area and estimated yield of hemp in 1916-17.*

Provinces.	Area.	Yield.
	Acres.	Cwts.
Madras	197,900	1,230,680
Bombay and Sind	150,900	997,097
Central Provinces and Berar*	161,100	1,064,648
United Provinces	176,900	947,475
Bengal	32,300	189,372
Punjab	49,200	181,078
Bihar and Orissa	15,200	63,960
Burma	600	1,467
North-West Frontier Province	700	1,316
Delhi	500	1,586
TOTAL .	785,300	4,678,679

* No estimate of average yield being available, the outturn has been calculated at the rate for Bombay.

Area and production.

The true hemp *cannabis sativa,* though spoken of commonly as *Indian hemp,* is probably not indigenous to India, but once introduced has been extensively cultivated, not so much for the fibre it yields as for the narcotic in the form of either *bhang, charas* or *ganja,* derivable from it. As a source of hemp fibre it is now grown in two chief localities—(1) the North-West Himalaya, including Garhwal, Kumaon, Nepal, Simla, Kangra and Kashmir, and to a much smaller extent, (2) in Sind.

Botanical and historical evidence, on the other hand, points to *crotalaria juncea* being indigenous to India and at a time when the value of jute as a fibre had not been commercially recognised, it received the early attention of the East India Company who procured their supplies from Salsette near Bombay and made attempts to introduce it into England as a substitute for Russian hemp. It is now widely grown in Bombay, the Central Provinces and the United Provinces. Of the 200,000 acres devoted annually to the crop in Southern India, the chief districts producing the fibre are the Godavari, Kistna and Tinnevelly districts of the Madras Presidency, and Hyderabad State, but it is grown for cattle fodder as well as for fibre. Throughout India it is grown as a *kharif* crop, *i.e.,* sown about the commencement of the rains and cut at the end of September or beginning of October. The fibre is obtained by retting the stems in water, bruising with stones, and re-soaking until the fibre strips off easily. The average yield of fibre ranges from 500 to 800 lbs. per acre and it has been calculated that the percentage of fibre to dry stem is about 8. The *sann* hemp exported from Calcutta is classified for trade purposes

as (1) *Benares*, (2) *Green* or *Raigarh*, and (3) *Bengal*, the bulk of the shipments being made between October and May. The pre-war shipments of Benares *sann* hemp averaged about 85,000 bales of 350 lbs. each. The Bombay trade amounted in normal times to about 80,000 pressed bales of 3½ cwts. each, the principal trade descriptions being *Pilibhit* (*United Provinces*), *Central Provinces* (including *Itarsi* (*Seoni*) and *Jubbulpore*), *Devgad* and *Gulbarga*. All descriptions are hackled or combed in Bombay and shipped under private marks as *combed* or *tow*—the latter term being applied to the short ends of the hemp which are put to special uses in certain trades such as shipbuilding. The chief grades shipped from Madras ports arranged in order of relative importance are—(1) *Cocanada*, (2) *Gopalpur*, (3) *Warangal*, and (4) *Upper Godavary*. Except in the case of Gopalpurs the colour is generally uniform, but shorts and tow are graded separately.

Sann hemp is a fibre of the same class as flax and much superior in durability to jute, and if flax spinning machinery be introduced, there is reason to hope that the production in India of all the coarser materials, such as hose pipes, belting and canvas for which the country has hitherto depended on imported flax manufactures might be commercially successful. Hitherto all the exports of *sann* hemp have been in the form of raw fibre.

Sisal hemp is obtained from the spiny leaves of *agave sisalana*, which is commonly grown as a hedge in many parts of India particularly on railway lines. The exploitation of the plant on a commercial scale has been attempted in Sylhet, Tirhoot, Bombay, and Southern India but probably because the right species was not cultivated, these efforts have generally proved unsuccessful. In the Mysore State where there is land suitable for its cultivation, experiments are now being made with the true *henequen* hemp of Yucatan (*agave rigida var. sisalana*) and ryots encouraged to grow it, but it is too early to say whether it will be the beginning of a new chapter in the history of hemp cultivation in India.

Exports.

The bulk of the shipments of raw hemp have hitherto consisted of *sann* hemp.

The following table illustrates the steady rise of prices during the war. In 1917-18 the shrinkage in the volume of shipments was particularly marked in the case of Calcutta, but there was a slight improvement in the following year with a remarkable advance in values.

TABLE No. 186.—*Quantities and values of hemp exported from 1913-14 onwards.*

Year.	Quantity.	Value.
	Cwts.	£
1913-14	711,548	682,319
1914-15	670,227	662,889
1915-16	608,267	683,583
1916-17	701,196	1,074,124
1917-18	306,716	529,602
1918-19	489,420	978,641

In 1913-14 the distribution among the provinces was as follows: Bengal 429,469 cwts., Bombay 224,790 cwts. and Madras 57,289 cwts. and in 1918-19: Bengal 268,597 cwts., Bombay 174,812 cwts. and Madras 46,011 cwts. The United Kingdom has always been the principal individual customer for *sann* hemp, but in pre-war days the Continent absorbed rather more. Prominent among the other countries which participated in the trade in 1918-19 were the United States of America with 35,000 cwts. and Norway with 11,000 cwts.

TABLE No. 187.—*Distribution of the trade in hemp among principal importing countries in 1913-14 and in 1918-19.*

Countries.	1913-14.		1918-19.	
	Quantity.	Value.	Quantity.	Value.
	Cwts.	£	Cwts.	£
United Kingdom . . .	297,444	294,694	384,962	809,369
Belgium	140,221	129,090	..	..
Italy	103,333	97,789	1,004	954
France	69,242	61,006	34,183	59,871
Germany	68,341	69,408	..	..
Greece	7,887	6,870	3,571	3,467
Denmark	7,639	6,806	5,000	8,717
Other countries . . .	17,441	16,656	60,700	96,264

Hackling and combing.

The question of adulteration was taken up by the London Hemp Association in 1913 with the Government of India who pointed out in their reply that buyers should insist upon getting the clean article and be prepared to pay higher prices for it. In 1916 the question was raised again by the Board of Trade who suggested to the India Office that grading might be controlled by legislation. This the Government of India pointed out would be a matter of considerable difficulty as so many different gradings are recognised in the Indian trade. The private marks of the bigger shippers carry with them a sufficient guarantee of consistent grading to satisfy most buyers, and hackling or combing as practised particularly at Bombay gets rid of the dust and dirt due to retting in dirty water. Unfortunately no suitable machinery has yet been devised and the fibre has all to be hand hackled, but the higher prices commanded for combed hemp have given a considerable impetus to this treatment.

Unit of sale and shipment.

From Madras ports shipment is usually made in steam-pressed bales of 400 lbs. each, lashed with rope, and the 500 lb. candy is the recognised unit of sale. Sixty per cent. of the South Indian exports before the war went from Cocanada and 22 per cent. from Gopalpur. In Bombay it is sold per candy of 25 Bombay maunds and shipped in bales weighing from 336 to 392 lbs. The unit of sale as well as of shipment in Calcutta is the bale of 400 lbs. though the bale of 350 or 375 lbs. is also recognised. Quotations for export are generally per ton, *c.i.f.*

There have always been considerable imports of raw hemp into India, chiefly of Manilla hemp from the Philippines. There are two mills in Calcutta which make rope and twine but only one of these utilizes the imported fibre. In 1906 the imports approximated in value to £46,000 and during the past five years the average has been in this neighbourhood though in 1918-19 it rose to nearly £171,000. In addition, there have also been considerable imports of manufactured hemp, chiefly canvas and hemp rope from the United Kingdom and the Straits Settlements.

Imports.

MINERAL OILS.

Production.

The production of petroleum in India increased from 118½ million gallons in 1904 to 277½ million gallons in 1913, due chiefly to the greater productivity of the Yenangyaung field in Burma which contributed 200 million gallons to this total. With an enormous Indian market adjacent, in which the use of kerosene for domestic consumption in supersession of vegetable oil illuminants has been assiduously exploited by competing interests, the export trade has always been comparatively small ; and as the Indian demand now exceeds the Burma supply, the volume of foreign imports has increased considerably in the last ten years, though the better class American case oil could not be sold at a price which the bulk of Indian consumers are willing to pay.

Exports.

In 1910-11 the exports scarcely exceeded 2½ million gallons, but they rose in the following year to nearly 15 and aggregated in 1913-14 22 million gallons valued at £142,000 as compared with the coasting trade of 119 million gallons valued at £2,840,000. The foreign trade in fact consisted largely of benzine, though oil fuel for the Navy and lubricating oil which, prior to 1st April 1914, were also included in the same statistical head helped to swell the total. There were after 1910-11 practically no foreign shipments of kerosene. In 1914-15 over 20 million gallons of benzine, benzol, petrol and other motor spirit were exported to the United Kingdom and the shipments in the following year (all to the United Kingdom) exceeded £150,000 in value. The exports, foreign and coastwise, other than from Burma are negligible. Military requirements, chiefly of petrol, in Mesopotamia have been largely met by re-export from Bombay to Persian Gulf ports and therefore do not figure in the statistics of foreign exports from Burma, though since 1917 there have been not inconsiderable direct shipments to Egypt from Rangoon. In the following table the distribution of the trade in 1913-14 and in 1918-19 is contrasted. The quantities and values of the export in the intervening years were 26,199,725 gallons in 1914-15, 28,138,583 gallons in 1915-16 and 24,963,888 gallons in 1916-17 valued at £170,157, £182,866 and £168,205 respectively. In 1917-18 exports amounted to 19,343,000 gallons valued at £126,556.

TABLE No. 188.—*Distribution of the trade in mineral oils contrasted in 1913-14 and 1918-19.*

Countries.	1913-14.		1918-19.	
	Quantity.	Value.	Quantity.	Value.
	Gallons.	£	Gallons.	£
United Kingdom	15,268,640	93,014	6,348,544	42,823
Holland	3,066,663	19,167	4,451,711	27,823
United States of America .	2,308,700	18,254	...	...
Germany	922,586	5,772	...	...
Australia	40,084	[illegible],507	...	...
Ceylon	39,644	1,600	[illegible]6,573	6,968
Straits Settlements . .	32,406	1,143	49,560	3,007
TOTAL .	22,308.700	142.732	24,844,776	230,692

The exports to the United States of America in 1913-14 consisted entirely of fuel and lubricating oil to the Pacific Coast. There were no shipments of kerosene to any foreign destination. In 1918-19 the volume of exports, both foreign and coastwise, broke all previous records. There were increased foreign exports of petrol, France and Italy being large recipients, and reduced shipments coastwise. Over 4 million gallons went to Egypt 'for orders.'

The unit of sale in Burma of fuel oil is the ton of 2,240 lbs. and of other oils the gallon.

An excise duty of 6 annas (*6d.*) a gallon was imposed by legislation in 1917 upon all motor spirit produced in India and Burma, and a corresponding duty of the same amount upon foreign imports.

FISH OIL.

Production.

Until the Madras Department of Fisheries interested itself in the matter, the large quantities of sardines (*clupea longiceps*) constantly shoaling on the Malabar Coast were converted into manure by the wasteful and offensive method of sun-drying on the open beach as they contain too much oil to be cured for edible purposes. In 1909 the Fisheries Department introduced a new and simple process for the extraction of the oil, the fish being boiled in open iron vats, and the resultant mass bagged and put into a hand screw press. The residue known as 'fish guano' makes an excellent fertiliser, which is shipped largely to Ceylon though there is a market for this cake also in the planting districts of South India ; while the oil is in demand for jute batching, candle and soap making and for paints. Every ten tons of sardines treated should yield $1\frac{1}{2}$ tons of fish oil and $1\frac{1}{2}$ tons of dry fish guano. In the last ten years upwards of 250 small factories have been erected along the coast for treating sardines in this manner. In the better equipped factories steam heating is employed and a clear yellow oil with a high stearine content is obtained. Over open fires the oil yielded is very dark in colour.

TABLE No. 189.—*Exports of fish oil and fish guano from the West Coast of the Madras Presidency from 1910-11 onwards.*

Year.	Fish oil		Fish Guano.	
	Quantity.	Value.	Quantity.	Value.
	Gallons.	£	Tons.	£
1910-11	72,880	3,503	188	910
1911-12	120,321	5,171	267	1,191
1912-13	66,986	3,118	1,872	10,328
1913-14	367,382	14,639	4,726	26,919
1914-15	220,839	7,952	102	517
1915-16	29,053	1,503	284	2,294
1916-17	10,444	425	1,018	8,902
1917-18	27,680	1,272	961	6,115
1918-19	124,542	6,577	7,328	29,028

The fall in exports in 1912-13 and in the years 1915-16 to 1917-18 was due to the scarcity of sardines. Cochin and Calicut are the chief ports of export. The principal destinations of the oil exported are the United Kingdom and Ceylon and to a smaller extent the Persian Gulf ports, though previous to the war, Germany and Belgium absorbed considerable quantities.

The unit of sale of the oil on the West Coast is the ton or the maund of 28 lbs., shipment being made in tins of 35 lbs. or casks weighing $3\frac{1}{3}$ and $6\frac{2}{3}$ cwts.

LEMON GRASS OIL.

Occurrence.

The extraction of the essential oil contained in lemon grass (*cymbopogon flexuosus*) is an industry of considerable promise in Southern India as the oil which contains a large percentage of *citral* is utilized largely in the manufacture of soaps and artificial scents. Cultivation may be described as a monopoly of the West Coast of the Madras Presidency, the main producing areas being the Native States of Travancore and Cochin and the southern part of the Malabar District. Lemon grass is both wild and cultivated. The hill sides on which it flourishes are fired in January. The first crop is ready to be harvested in July and the season for distillation extends to October, furnaces and stills being set up in the neighbourhood of the plantations. The method of distillation is generally crude, and the resultant oil highly coloured and so adulterated that the citral content seldom exceeds 50 per cent. as compared with 83 per cent. in the pure article. The trade which was inconsiderable until the beginning of the present century received a great impetus about 1903-04, but the temptation of high prices encouraged crude methods of distillation and subsequent adulteration, and when the demand in Europe was discovered to be unequal to the absorption of the quantity which Travancore and Malabar were prepared to export, a fall in prices which followed made distillation scarcely profitable.

There was some revival again before the war both in prices and in the volume of the trade, and private efforts supplemented by those of the Travancore Darbar to obtain a better quality of oil have proved that there is a steady and increasing demand in Europe and America for the purer product which is yielded by redistillation. Travancore oil used in pre-war times to be shipped either from Alleppey or Cochin, but no export statistics are available for the former port. The quantities that went forward from ports in British India, mainly Cochin, from 1913-14 onwards, are shewn in the following table.

TABLE NO. 190.—*Quantity and value of lemon grass oil exported from 1913-14 onwards.*

Year.	Quantity.	Value.
	Gallons.	£
1913-14	47,522	67,955
1914-15	27,796	37,914
1915-16	31,700	30,102
1916-17	34,993	32,044
1917-18	27,009	25,944
1918-19	17,049	22,181

The principal pre-war destinations were France, which accounted for more than 50 per cent. of the total, Germany, the United Kingdom and the United States, and the war has not made any material alteration in the distribution of the trade except that Germany has been eliminated and a new market apparently found in Switzerland.

The unit of sale on the West Coast is a dozen bottles of 22 oz. each, the unit in Madras being the lb. Shipment is usually made in cases containing a dozen bottles, or in drums containing the equivalent of 20, 23, 45 or 60 dozen bottles.

MANURES.

The Indian cultivator is generally too poor and his holding too small to make extensive manuring profitable. Green manuring is common and the benefits to the soil from the cultivation of nitrogenous plants is not unrecognised, but dried cow dung which is the commonest manure available is too commonly preferred as fuel for domestic purposes. The chief internal demand for manures is therefore from the tea and coffee planting industries for whom, in addition to the supplies available in the country, over 8,000 tons of artificial and mineral manures were imported in 1913-14.

Fish manures.

Of the animal manures produced in India, the principal are derived from fish and bones. The fish manure industry on the Malabar Coast has already been noticed.* The total exports from India of fish manure (including an inconsiderable

* *Vide* p. 266.

quantity of guano derived from the excrement of birds and bats) are shewn in the table below.

TABLE No. 191.—*Quantity and value of fish manure and guano exported from 1913-14.*

Year.	Quantity.	Value.
	Tons.	£
1913-14	16,284	64,044
1914-15	6,724	28,975
1915-16	5,109	27,054
1916-17	12,745	78,347
1917-18	12,747	103,399
1918-19	18,185	143,415

More than half of the total is contributed by Madras, Burma being the most important of the remainder. Shipments were mainly directed to Ceylon and the Straits Settlements.

The unit of sale in Madras is the cwt., the ton or the candy of 600 lbs. and shipment is made in bags of ¾ or one cwt. or of 2½ qrs. In Burma sales are based on a hundred viss of 360 lbs. and the manure is shipped in bags of 280 lbs. nett.

Bone manure.

There was a considerable demand for crushed bones in France and Belgium for the manufacture of bone-black, buttons, etc. Bone meal was also exported in pre-war days to Hamburg, while a coarser quality went to Liverpool and Hull for the manufacture of superphosphates. The war which cut off India from external supplies has encouraged the internal demand. In 1917 there were 13 bone crushing mills in existence in British India worked by mechanical power, four in Bombay, five in Bengal, two in Madras and one each in Burma and the United Provinces.

The following table (which does not however distinguish crushed bones from meal) shews how the trade has been distributed during the last six years.

TABLE No. 192.—*Quantity and value of exports of bones and bone meal from India from 1913-14 onwards.*

Year.	Quantity.	Value.
	Tons.	£
1913-14	105,413	522,233
1914-15	63,975	319,553
1915-16	50,636	235,583
1916-17	42,042	216,277
1917-18	21,842	109,381
1918-19	16,734	84,409

The provincial distribution of the trade in the last pre-war year was as follows :—Bengal 43,337 tons, Sind 25,606, Bombay 25,364, Madras 9,425 and Burma 1,681 tons, the chief destinations being Belgium, France, United Kingdom, Japan and Germany. In 1918-19 the bulk of the shipments went to Ceylon for the tea and rubber plantations, the balance being distributed between Japan and the United States.

Unit of sale and shipment.

The unit of sale in Calcutta, Bombay and Madras is the ton of 2,240 lbs. though Karachi sells on the standard maund. In the case of bone meal prices are quoted per mesh of $\frac{3}{8}''$, $\frac{3}{16}''$, $\frac{3}{32}''$ and $\frac{5}{8}''$. In the case of crushed bones the range is from $\frac{1}{8}''$ to $\frac{3}{4}''$ mesh. Shipment is effected from Bombay in bags of 168 lbs. and from Karachi in bags weighing 168, 200 and 224 lbs. nett. In Calcutta bone meal, steamed and unsteamed, and crushed bones are exported in bags of 224 lbs. nett. From Madras ports these are shipped in one cwt. or two cwt. bags.

There are also considerable exports of dried blood obtained from the slaughter houses in the big cities such as Calcutta, Madras and Bombay, the trade name for which is 'bloodmeal.' Over 1,000 tons were shipped to Ceylon in 1918. Dried blood is sold per unit of nitrogen 10 to 12 per cent., animal meal 8 to 10 per cent. nitrogen and horn meal 12 to 13 per cent. nitrogen.

Mineral manures.

There is a demand for inferior saltpetre, either unmixed or mixed with bone meal for manurial purposes, particularly in Ceylon. The only other mineral manures exported in any quantity are sulphate of ammonia, sulphate of potash and kainit.

The annual production of sulphate of ammonia in India at the present moment is estimated to be 3,000 tons only, chiefly for the export trade, the total quantity shipped in 1916-17 being rather less than 2,000 tons valued at £40,000. The entire quantity was shipped from Bengal, and Java, where it is required for sugarcane cultivation, was the main recipient. The unit of sale is generally the ton and shipment is made in bags of 2 cwts. nett.

Other manures.

Of the other manures exported from India the principal are oilcakes, the chief items being linseed, castor, groundnut, sesame and rape cakes. These have already been dealt with in the respective articles on seeds.

SPICES.

Pepper.

The trade in pepper is perhaps the oldest, and during the Middle Ages was one of the most important branches of commerce between Europe and the East. Then and even earlier the West Coast of India enjoyed a practical monopoly, there being evidence that it was flourishing as early as the fifth century A.D., but by the beginning of the

nineteenth century the competition of the Malay Archipelago had proved too strong and it had lapsed into comparative insignificance. Yet even now the average value of the exports from the Malabar Coast ports approximates to £300,000 a year.

Area and production.

Pepper is the berry of a vine-like climbing plant (*piper nigrum*) which grows wild in the forests of Malabar and Travancore and is extensively cultivated by Europeans and Indians in and below the Western Ghats from Karwar to Cape Comorin. It thrives in a hot, moist climate with an abundant rainfall. In Bengal, pepper is grown to a very limited extent only in the northern parts of Jessore while in Assam, except in Sylhet and the southern slopes of the Khasia Hills, very little is produced. In Bombay the area under the crop in 1904-05 amounted to 6,736 acres and in 1905-06 to 7,483, practically the whole of which was in Kanara. In Madras, the principal producing areas are Malabar, Cochin and Travancore and, to a small extent, Coorg and South Kanara. The vines are usually propagated from cuttings and the first crop is obtained in the third year, the berries ripening in March. A vine in full bearing in a good year will carry about 1,000 clusters of fruit yielding 4 lbs. of dried pepper.* The yield from some of the Kanara gardens in the Bombay Presidency is probably rather higher. The life of a vine is about seven years. To obtain *white* pepper the berries after being plucked are soaked in water for seven or eight days until the pulp ferments. The mass is then trampled under by *coolies* to remove the pulp from the stone, and sun-dried. Little or no white pepper is produced in India. *Black* pepper is derived from the unripe berry picked green, heaped and dried when the skin and pulp adheres as a wrinkled covering to the stone. Two grades of quality are known on the West Coast, *viz.*, *Alleppey* and *Tellicherry* of which the latter in normal times commands a slight premium over the former, as the pepper is bolder and heavier.

Exports.

The total exports of Indian pepper during the period 1900—1907 averaged 12,000,000 lbs. valued at about £275,000. The progress of the trade between the years 1913-14 and 1918-19 may be illustrated by the table below.

TABLE No. 193.—*Quantity and value of pepper exported from India from 1913-14 onwards.*

Year.	Quantity.	Value.	Average value per lb.
	Lbs.	£	
1913-14	13,879,964	289,943	5·0 *d.*
1914-15	15,985,054	309,241	4·5 *d.*
1915-16	15,225,029	308,347	4·5 *d.*
1916-17	13,981,750	411,849	7·0 *d.*
1917-18	11,097,557	345,563	7·4 *d.*
1918-19	12,846,748	408,889	9·0 *d.*

* Imperial Gazetteer. The Indian Empire, Vol. III, page 54.

The average value, it will be noticed, has been steadily advancing during the last three years.

The chief importing countries in the last pre-war year are shewn in the following table.

TABLE No. 194.—*Distribution of the trade in pepper among principal importing countries in 1913-14.*

Countries.	Quantities.	Value.
	Lbs.	£
Germany	3,110,541	64,571
Italy	2,896,660	60,730
United States of America	2,352,228	45,973
United Kingdom	1,579,274	32,399
Asiatic Turkey	802,506	19,690
France	758,156	14,722
Persia	454,064	10,798
Austria-Hungary	330,400	6,817
Arabia, Maskat and Trucial Oman	272,478	5,936
Holland	251,420	4,808
Canada	156,800	3,047

The shipments to Germany were unusually heavy. Pepper is an ingredient in the manufacture of tear shells. Tellicherry pepper is not only shipped from Tellicherry, but also from the neighbouring ports of Calicut, Cannanore and Badagara, while Cochin, Alleppey and Tuticorin are the outlets for the pepper grown in the Cochin and Travancore States. The distribution of the trade in 1913-14 among the provinces is given in the table subjoined. Even in pre-war days the exports credited to Bengal were probably of South Indian origrin, and her participation in the trade has latterly been enhanced owing to the greater facilities for freight obtaining at Calcutta.

TABLE No. 195.—*The distribution of the trade in pepper among the various provinces in India in 1913-14.*

Provinces.	Quantity.	Value.
	Lbs.	£
Madras	12,065,786	246,177
Bombay and Sind	1,689,772	40,780
Bengal	123,734	2,959
Burma	672	27
TOTAL	13,879,964	289,943

Unit of sale and shipment.

Pepper is packed for export from West Coast ports in bags of 1¼ cwts. nett, from Bombay in bags of 70, 168 and 196 lbs. nett and from Calcutta in bundles of 224 lbs. nett. The unit of sale in Tellicherry is the cwt. and in Cochin the 600-lb. candy. Bombay sells on the candy of 21 Bombay maunds and Calcutta on the bazaar maund.

In addition to the foreign trade, exports for internal consumption by rail and river and coastwise by sea between the provinces have always been considerable, the chief importing centre being Calcutta. During the five years ending 1905-06 these classes of imports averaged 16 million lbs. of which Calcutta and Bombay ports each took 6½ million lbs. Imports from foreign countries were mainly from the Straits Settlements and Ceylon, the total quantity in 1916-17 being 4,615,000 lbs., in 1917-18, 3,650,000 lbs. and in 1918-19 1,035,000 lbs.

Imports.

Chillies.

Cultivation.

Originating in tropical America and introduced into India somewhere about the middle of the seventeenth century by the Portuguese, there are at present many varieties of *capsicum* disseminated over large tracts in India, both as garden and field crops. No separate statistics of production or of acreage are available but in Madras, the province with by far the largest production, the area has been estimated at not less than 300,000 acres annually ; and while the distribution is pretty general, cultivation is particularly large in the Guntur District and the uplands of Godavari and Kistna. Outside Madras the chief producing areas are in Eastern and Northern Bengal, in the Kyaukse, Sagaing and Myingyan districts of Burma and in Bombay where there is extensive garden cultivation particularly in the Dharwar, Belgaum, Khandesh, Satara, Poona and Sholapur districts. To a limited extent the crop is raised in the Punjab, where when grown at an elevation, the chillies are said to acquire a greater pungency to which perhaps is due the popularity of the so-called Nepal cayenne. The yield is subject to great variations in different localities.

Unit of sale and shipment.

The pods are sun-dried and packed for the market in Southern India in gunnies each containing 70 to 75 lbs., or in bags weighing 168 lbs. gross. For export the unit of sale is the candy of 500 lbs. generally, although in Tuticorin it is the *tulam* of 15 lbs. In Bombay the sale is on the basis of a candy of 21 Bombay maunds, and in Calcutta of the bazaar maund, shipment being made from the former port in bundles of 196 lbs. nett and from the latter in bags of 205 lbs. The unit of sale in Rangoon is a hundred viss of 360 lbs. and chillies are packed for export in bags weighing from 48 to 112 lbs. nett.

Exports.

Of course the bulk of the chillies grown disappears in local consumption as an ingredient in curries, chutneys and other food preparations. The dried fruit reduced to powder is the red pepper or cayenne of commerce. The export trade does not greatly interest any large firms and the business is chiefly in the hands of Indians with branches or correspondents in Ceylon and the Far East. The distribution and volume of the trade varies little from year to year. The average shipments have

for a long time been in the neighbourhood of 15 million lbs. a year but in 1918-19 the total was only 9,217,000 lbs. due to failure of this crop in the Guntur District of the Madras Presidency and the consequent restrictions placed upon export to prevent depletion of stocks for local consumption. In the following table the quantities and values of pepper exported in 1913-14 are shewn with the shares of the principal recipients.

TABLE No. 196.—*Share of the principal importing countries of chillies in 1913-14.*

Principal countries.	Quantities.	Value.
	Lbs.	£
Ceylon	10,674,719	90,813
Straits Settlements	3,552,346	28,474
United States of America	690,284	5,218
Italian East Africa	380,988	3,181
Mauritius and Dependencies	280,483	2,048
Aden and Dependencies	204,036	1,671
Other countries	320,229	2,815
TOTAL	16,103,085	134,220

The only appreciable alteration in the course of the trade since the outbreak of war has been the greater interest taken by the United Kingdom which took 10,000 lbs. only in 1913-14, while the total for 1916-17 was 1,108,000 lbs. Very nearly 60 per cent. of the exports go from Southern India, the principal ports concerned being Tuticorin (mainly for Ceylon), Madras, Negapatam and Cocanada. Calcutta, Rangoon and Bombay follow in the order named.

Ginger.

Cultivation.

Ginger (*zinziber officinale*) has been cultivated in India for centuries, but no statistics as to area of cultivation or outturn are available. On the Malabar Coast which has long been famous for its ginger, cuttings are planted in May and the rhizomes dug up in the following November. Other parts of India where there are considerable quantities grown are the Surat and Thana districts of the Bombay Presidency, the Rangpur District in Bengal and the Kumaon District of the United Provinces. In a good year 2,000 lbs. of dry ginger to an acre is a fair average yield. The rhizomes are purchased from the cultivator by dealers who either sell them again as *green* or *dried* ginger. Dried ginger again is either *bleached* or *unbleached* according as it is parboiled or scraped before being exposed to the sun. Uncoated, (*i.e.*, scraped) Cochin ginger is reputed the best marketed in India.

Exports.

The export trade does not attain to any great dimensions, but ginger is to be found in almost every bazaar and the internal consumption for curries and

for medicinal purposes must be very great. The chief external markets for Indian ginger in pre-war times were the United Kingdom, Aden, the United States of America, Arabia, Turkey, Ceylon and Germany. Ginger is usually packed for export from Cochin and Calicut in double gunnies containing 1 to 1¼ cwt. nett, or bags containing 126 lbs., the unit of sale at the former port being the candy of 600 lbs. and at the latter the cwt. From Calcutta it is shipped in bags of 2 maunds and from Bombay in bags of 100, 112 and 168 lbs. nett, though sales are made on the basis of the cwt. at the latter port. In the table below are shewn the quantity and value of ginger exported during the last six years.

TABLE No. 197.—*Quantity and value of exports of ginger from 1913-14 onwards.*

Year.	Quantity.	Value.
	Lbs.	£
1913-14	9,214.471	122,661
1914-15	7,529,188	87,321
1915-16	6,289,699	71,351
1916-17	6,181,502	84.338
1917-18	7,027,130	111,632
1918-19	3,842,677	65,707

Of the quantity exported in 1913-14, 4,220,551 lbs. went from Bombay, 3,158,653 lbs. from Calicut, 1,275,421 lbs. from Cochin and 314,356 lbs. from Calcutta. The subsequent decline in the volume of export is largely ascribable to the greatly reduced tonnage available at West Coast ports while the war lasted. The total shipments for the Madras Presidency in 1918-19 aggregated less than 800,000 lbs. In 1915-16, 1916-17, and 1917-18 exports from Bombay were above the level of the pre-war year.

Imports.

While India exports on an average about 8,000,000 lbs. of ginger every year, her imports aggregate 2,000,000 lbs. chiefly from Japan, China and Hongkong into Bombay and Calcutta.

Cardamoms.

Cultivation.

The cardamoms which enter in the export trade of India are obtained from the capsules of a perennial herb *elettaria cardamomum* indigenous to the humid forests of Western and Southern India where it is extensively cultivated at elevations from 500 to 5,000 feet. There are about 20,000 acres under cardamoms in the Madras Presidency (chiefly the Malabar and Madura districts), Mysore, Coorg and Travancore and 5,000 acres in Bombay (chiefly in the Kanara District). The normal outturn per acre varies from 50 to 250 lbs. and a great deal is consumed in India as well as considerable imports from Ceylon. Two varieties of cardamoms are recognised,

Mysore, round, smooth-skinned capsules and *Malabar,* long, rough-grained capsules, known as *shorts* and *short longs.* The former are preferred and command a higher price.

Uses.

Cardamoms are chiefly used for medicinal purposes, for flavouring cakes and liquors and as an ingredient in German sausages. The essential oil used medicinally as a carminative and in connection with perfumery in France and the United States of America is derived not from the Malabar or Mysore cardamom, but from the so-called 'greater cardamom' of Nepal (*amomum subulatum*).

Method of marketing.

The capsules which ripen in September and October are hand-gathered and sent down to the ports, and while some are dried and bleached in the sun before export, better qualities are generally cured more elaborately. After being sulphur-bleached the stalk end of each pod is carefully clipped and the capsules are then graded. Such cardamoms at the present moment fetch in London about double the price per lb. of the less carefully prepared pods. In some quarters there has been an increased demand lately for dried green cardamoms which are supposed to be more highly flavoured than the bleached cardamoms. Cardamoms which are packed for export from Madras ports in cases of one cwt. and bags of 126 or 140 lbs. are usually consigned for sale to London auction rooms. The pre-war quotation *f. o. b.* West Coast was about Rs. 30 per maund of 25 lbs. Prices have been affected in recent years by over production. The unit of sale in Bombay is the *Surti* maund of 39·2 lbs. and shipment is made in bags containing 160 to 175 lbs. nett. The following table shews the chief ports of export and the proportionate share of the trade enjoyed by each in the year preceding the outbreak of war.

TABLE No. 198.—*Share of the ports in exports of cardamoms in 1913-14.*

Ports.	Quantity.	Percentage.
	Lbs.	
Bombay	191,769	51
Calcutta	63,905	17
Tuticorin	55,915	15
Calicut	19,732	5
Tellicherry	17,362	4
Mangalore	12,639	3

Exports from Calcutta were in this year considerably above the average, owing to greater facilities for shipment, large quantities being railed up from the West Coast for despatch from this port.

The next table shews the foreign trade, quantity and value, from 1913-14 onwards.

TABLE No. 199.—*Quantity and value of cardamoms exported from India from 1913-14 onwards.*

Year.	Quantity.	Value.
	Lbs.	£
1913-14	373,401	49,994
1914-15	413,135	54,369
1915-16	482,764	45,597
1916-17	311,780	32,400
1917-18	893,186	80,221
1918-19	641,650	51.605

Though the volume of exports from Madras ports declined from over 100,000 lbs. in 1913-14 to 21,000 lbs. in 1917-18, very large shipments from Calcutta and Bombay, chiefly to the United Kingdom, raised the all-India total in the latter year to nearly three times that for 1916-17, and shipments in 1918-19, though smaller, were yet substantially above the pre-war level. Cardamoms were chiefly shipped before the war to the United Kingdom, but it is believed that London was only a distributing centre and that the bulk of the crop found its way to Germany and Scandinavia. After the United Kingdom the principal direct customers for Indian cardamoms before the war were Arabia, Aden, Germany, Turkey in Asia, Ceylon and the Straits. Latterly, however, Egypt has been absorbing increasing quantities.

Betelnuts.

The betelnut, which is the fruit of the areca palm (*areca catechu*), forms in conjunction with the leaf of the betel vine (*piper betle*) and a little lime and clove or nutmeg the common masticatory of the East, known all over India as *pan supári*. Statistically both the betelnut and the betel leaf are regarded as spices and the internal demand for the former is so great that the import trade is of much greater moment than the export, though there is some traffic outwards with colonies where Indian emigrants abound. Though supplies of betel leaf, which are derived from a climbing plant belonging to the same family as pepper, are drawn from considerable distances by rail and river, the fact that they have to be chewed green limits foreign exports, which are negligible, to the island of Ceylon. The areca palm is confined almost entirely to the moist tropical tracts that fringe the coastline and it is seldom found more than 200 miles from the coast. No statistics of area or production are available but the number of trees must be very large as the demand is practically universal. In Southern India a full-grown tree is calculated to yield 250 to 300 nuts annually, but elsewhere, as for example in Burma, the average output is very much lower. The nut is prepared in a great variety of ways for sale, being sometimes marketed sun-dried only, and sometimes plucked unripe and boiled and sliced. The Indian tariff recognises six different classes with different valuations for purposes of import duty.

The following table illustrates the insignificant extent of the export trade as compared with the import trade.

Exports.

TABLE No. 200.—*Exports and Imports of betelnuts from 1913-14 onwards.*

Year.	Exports.		Imports.	
	Quantity.	Value.	Quantity.	Value.
	Lbs.	£	Lbs.	£
1913-14	439,886	8,224	127,464,241	819,086
1914-15	482,160	10,111	140,298,125	868,306
1915-16	329,714	6,826	131,111,854	850,434
1916-17	398,574	8,413	128,277,848	870,787
1917-18	581,296	11,771	115,616,725	814,488
1918-19	362,419	8,119	142,527,683	1,141,269

The principal recipients of Indian betelnuts are Aden, Natal, Mauritius, East Africa and Fiji, and the chief ports of export Bombay, Negapatam, Tuticorin and Calcutta; but while the war lasted exports from South India were confined to Madras. The bulk of the imports come from Ceylon, the Straits Settlements, Java and China.

Unit of sale and shipment.

The unit of sale in Calcutta is the bazaar maund and the nuts are shipped in bags weighing 2 maunds. In Bombay the unit of sale is the candy of 21 Bombay maunds or the maund of 28 lbs., shipment being made in bags of 140 to 182 lbs.

Cinnamon.

Marketing.

The true cinnamon of commerce is the dried bark of *cinnamomum zeylanicum*, a native of Ceylon but found also on the Western Ghats in Southern India at altitudes up to 6,000 feet. The plant exists under cultivation as a coppiced bush. The bark after removal is pressed in bundles until slight fermentation sets in, which allows of the scraping of the outer covering and the pulp underneath. These strips are then cut into lengths of about twelve inches and dried, when they contract into the shape of *quills* under which name they are sold. Thicker pieces of bark from the larger shoots are sold as *chips* which command lower prices as the flavour is inferior. Three valuable essential oils are also obtained from the tree, one from the bark, one from the leaves, known as *clove oil*, and one from the root, all with medicinal properties. No statistics of area or production of cinnamon are maintained but the yield per acre is said to be 150 lbs.

Exports.

The provinces contributing to the export trade are Madras and Bengal, the chief port in the former presidency being Tellichery on the West Coast. The true cinnamon is very commonly adulterated, specially in powder form, with

cassia lignea the bark of *cassia cinnamomum* common in East Bengal, the Khasia Hills and Burma, and the exports from Bengal would most probably seem to be of this origin. The following table illustrates the extent of the trade. The principal destinations of the exports are the United Kingdom, South Africa and Mauritius.

TABLE No. 201.—*Quantity and value of exports of cinnamon from India from 1913-14 onwards.*

Year	Quantity.	Value.
	Lbs.	£
1913-14	33,170	1,015
1914-15	39,711	869
1915-16	54,147	1,144
1916-17	66,045	1,356
1917-18	55,554	1,064
1918-19	71,579	2,329

Unit of sale and shipment.

The unit of sale in Calcutta is the bazaar maund and shipment is made in bags of 2 maunds. On the West Coast sales are on the basis of the candy of 600 lbs. or the maund weighing 28 lbs., while exports are made in bags of 100 or 168 lbs.

Cloves.

Cloves are the dried, unexpanded flower buds of *eugenia caryophyllata* plucked when they assume a bright pink or scarlet colour and generally dried in the sun with or without scalding, the yield from each tree being about 6 or 7 lbs. of dry cloves. There is no systematic cultivation in India and no statistics of acreage or yield are separately recorded. Cloves are chiefly grown in the foothills of the Western Ghats in the Madras Presidency. A valuable essential oil is obtained from the dry buds which is largely employed in perfumery.

Exports.

Zanzibar and Pemba contribute four-fifths of the world's supply of cloves and India on an average imports 9,000,000 lbs. valued at £210,000 from these two countries. Exports from India on the other hand are small and in value they seldom exceed £600. In 1913-14 the total quantity shipped reached barely 10,000 lbs., though in the two following years the figures rose to 14,000 and 21,000 lbs. respectively, again experiencing a fall in 1916-17 to 8,000 lbs. In 1917-18 the quantity was 19,300 lbs. and in 1918-19, 19,000 lbs. The chief destinations were Natal and Fiji and the entire quantity went from Calcutta, probably on account of freight being more readily obtainable there than in Madras which used to enjoy a monopoly of this trade.

The unit of sale in Calcutta is the seer and shipment is made in bundles weighing 2 bazaar maunds.

COIR.

Of the products derivable from the coconut, coir fibre and manufactures thereof were until recently of scarcely less importance than the oil extracted from copra. This industry suffered severely from the effects of the war but the exports of coir in 1913-14, foreign and coastwise, were of considerably more value than those of coconut oil.

Coir fibre.

In normal times the manufacture of coir is a flourishing cottage industry on the Malabar Coast, most of the workers being women. The bulk of the coconut husks are buried for at least eight months and often for double that time in pits on the foreshore of rivers or backwaters, and then removed and beaten on stones till the pith and all extraneous particles are removed. The better qualities of fibre are yielded by this method. The varieties of coir known in the trade as *unsoaked*, which are generally inferior, are obtained by treating the husks immediately after the nuts have been extracted or alternatively, storing the nuts in a dry place for six or seven months and after they have been extracted, immersing the husks in water for twelve hours or so before beating. Five or six nuts should yield one lb. of dried clean fibre.

Exports of fibre.

Shipments of coir fibre are inconsiderable but such as there are go forward usually in hydraulic pressed bales containing 200 lbs. nett, gunny-covered and hoop-bound, the unit of sale being the candy of 600 lbs. The table below shows the quantities and values of coir fibre exported from 1913-14 onwards.

TABLE No. 202.—*Quantities and values of coir fibre exported from 1913-14 onwards.*

Year.	Quantity.	Value.
	Tons.	£
1913-14	746	11,450
1914-15	246	3,491
1915-16	333	4,509
1916-17	248	3,295
1917-18	153	1,982
1918-19	300	4,353

Cochin has a monopoly of the exports of this fibre from India.

Coir yarn.

It is more usual to convert the fibre into yarn or rope. In the former case it is spun to the required length either by hand as is the case in Malabar, or on the spinning wheel as in Travancore. Husks soaked in tidal backwaters with a considerable scour are commonly believed to yield the best yarn, *e.g.*, the *Anjengo*, *Alapat* and *Ashtamudy* varieties, all named after the

localities where they are produced and easily distinguishable by their colour and twist.

Between the spinner and the shipper the yarn passes through many hands. The first middleman may be a petty shopkeeper who has accepted yarn in payment for rice or salt, or the owner of a shed in which half a dozen or more piece-workers wash and spin the fibre from his coir pits. Eventually the yarn, which is all in short hanks, reaches dealers who sort it roughly according to colour and thickness and put it up in bundles weighing a standard maund or multiples thereof, before disposing of it to the big dealers at the coast ports from whom the shippers get their supplies, or to the manufacturers. The shipper is obliged, when the yarn has been examined and graded by women according to size and colour, to get it rewinded into long hanks of 450 yards weighing 2½ lbs. each at a cost of about Rs. 10 per ton because the village workers cannot be persuaded to do so. These hanks are then tied across and made into bundles each weighing one cwt., which again are baled and hydraulically pressed before shipment. Inferior yarns are done up in bundles known as *dholls* of 5 or 7 lbs. for acceptance as broken stowage. The principal ports of shipment are Cochin and Calicut.

Trade organisation.

The exports of manufactured coir exclude rope (which is separately classified in the trade returns) and consist chiefly of yarn. The following table shews the quantity and value exported since 1913-14.

Exports of manufactured coir.

TABLE No. 203.—*Quantity and value of manufactured coir, excluding rope, exported since 1913-14.*

Year.	Quantity.	Value.
	Tons.	£
1913-14	38,610	592,741
1914-15	23,790	380,299
1915-16	27,140	426,824
1916-17	28,490	436,360
1917-18	19,930	307,365
1918-19	13,165	233,346

In addition, there were shipments averaging about 1,600 tons of yarn annually from the Travancore port of Alleppey.

Before the outbreak of war Germany took rather more and the United Kingdom rather less than 30 per cent. of the whole, the balance going in about equal shares to Holland, Belgium and France.

The West Coast ports are practically closed to traffic during the south-west monsoon, and the season for shipment therefore runs from September to May. The yarn is shipped from Cochin and Calicut in hydraulic pressed bales weighing 3 cwts. apiece, and from Cocanada in

bales weighing 280 lbs. nett. The unit of sale in Cochin is the candy of 600 lbs., in Calicut the cwt., and in Cocanada the candy of 500 lbs.

Of the ports participating in the trade, Cochin, it will be seen, has a preponderating share.

TABLE No. 204.—*Quantity and percentage share of the principal ports in the exports of manufactured coir (excluding rope) in 1913-14.*

Ports.	Exports.	Percentage.
	Tons.	
Madras Presidency—		
Cochin	29,329	76
Calicut	7,940	21
Cocanada	713	1
Tuticorin	258	·8
Bombay Presidency—		
Bombay	255	·7

Grades of yarn.

The signs of quality are colour, which should be golden, strength, length and lightness. On the Malabar Coast about a dozen different grades are recognised, which may be placed roughly as follows in order of merit.

Alapat . . .	Fine hand-twisted.
Anjengo . . .	All wheel-twisted.
Aratory . . .	All wheel-twisted.
Ashtamudy . .	All wheel-twisted.
Kuruva or Curwa .	All wheel-twisted.
Vycome . . .	Weaving yarns, hand-twisted.
Beach . . .	Weaving yarns, hand-twisted.
Calicut (fine unsoaked)	Weaving yarns, hand-twisted.
Beypore . . .	Weaving yarns, hand-twisted.
Quilandi . . .	Weaving yarns, hand-twisted.
Cochin . . .	Roping yarn.

All the above yarns are two-ply and so is the loosely twisted yarn shipped from Cocanada. *Alapat* coir is probably the finest in the world and has always commanded a higher price than any other variety on the European market. There is also *Divi* coir which is brought over to the mainland to the extent of four to five thousand cwts. annually by the Laccadive and Amindivi islanders and taken over by Government at privileged rates in lieu of tribute. This coir is thereafter sold by auction at Mangalore, and though it varies very much in quality, the best is only inferior to *Alapat* and *Anjengo.* The importance of the industry on the Malabar littoral is illustrated by the table subjoined which gives details of the shipments coastwise to other parts of India as well as the foreign exports.

TABLE No. 205.—*Quantities and values of manufactured coir (excluding rope) exported (foreign and coastwise) from 1913-14 onwards from the Madras Presidency.*

Year.	FOREIGN.		INDIAN PORTS.		TOTAL.	
	Quantity in tons.	Value £	Quantity in tons.	Value £	Quantity in tons.	Value £
1913-14	38,300	587,000	9,450	103,000	47,750	690,000
1914-15	23,550	373,000	10,650	129,000	34,200	488,000
1915-16	26,800	421,000	9,650	92,000	36,450	514,000
1916-17	27,900	423,000	9,500	90,000	37,400	514,000
1917-18	19,000	290,000	12,650	122,000	31,650	412,000
1918-19	13,090	232,000	13,300	139,000	26,390	371,000

Coir matting.

Mats and matting of every description are woven from coir yarn on handlooms at Alleppey and Cochin. The value of the exports from the former port in 1913-14 was £10,000 and the trade has expanded very considerably during the war with increased shipments from Cochin, the value of whose exports amounted in 1918-19 to £11,000.

Coir rope and cordage.

Quantities of coir rope and cordage (all hand-made) are also produced, but apart from coastwise traffic chiefly to Bombay whose trade amounted in 1917-18 to £36,000 in value, the trade is insignificant since coir rope cannot compete with Manilla in most foreign markets.

TABLE No. 206.—*Exports of coir rope and cordage* from 1913-14 onwards (quantities and values).*

Year.	Quantity.	Value.
	Tons.	£
1913-14	3,021	70,189
1914-15	2,227	56,693
1915-16	2,976	70,165
1916-17	2,944	74,361
1917-18	2,941	81,057
1918-19	2,717	78,448

Coir rope is made up into lengths of 60 or 120 fathoms and sized by circumference. The unit of sale in Calicut is the cwt. and in Cochin the candy of 600 lbs., while shipment is made from the former port in coils of 1 to 2 cwts. and from the latter in bales of 3 cwts.

In the last two years of the war about 150,000 sq. yards of coir screening (similar to Kentish hop screening) were also supplied monthly to the military authorities in France for *camouflage* purposes. Other manufactures of coir include mesh bags which are very useful for the carriage of tanning bark and other produce from one part of India to another.

* Including small quantities of rope and cordage manufactured from other vegetable fibre.

RUBBER.

History of cultivation.

Though a number of rubber yielding trees are indigenous to Indian forests they are not sufficiently abundant to justify exploitation, and, apart from two plantations in Assam under *ficus elastica*, the spasmodic efforts made to grow rubber on a commercial scale never got beyond the experimental stage before 1900. There are two tracts enjoying very similar climate and rainfall scarcely less favourable than Malaya which pre-eminently offer potentialities for rubber growing in India, *viz.*, the Tenasserim Coast in Burma and the Malabar Coast below the Western Ghats from Mangalore to Cape Comorin. The more southerly districts have a more evenly distributed rainfall, closely approximating to that of Ceylon. In cultivation and transport facilities Southern India enjoys considerable advantages over Burma where communications are very backward and labour, other than imported, not easy to obtain. In Travancore the Shencottah and Mundakayam districts and the Rani valley are the chief centres of the industry, the pioneer estate at Thattakad on the Periyar River being opened up in 1902 with *Para* rubber (*hevea brasiliensis*) which has generally proved far the most suitable variety for cultivation in Southern India. In the last seventeen years a great deal of cultivation particularly in Travancore and Cochin (not infrequently in combination with tea) but also to some extent in British Malabar, Coorg and the slopes of the Shevaroy Hills in the Salem District has begun, while the Burma Government plantation at Mergui having demonstrated that *Para* rubber could be successfully grown in Burma was about 1910 sold to a limited company, and other plantations opened there and in the neighbourhood of Rangoon.

Acreage.

The area under rubber in India in 1918 is estimated to have been in the neighbourhood of 125,000 acres, the provincial distribution of which is shewn in the following table.

TABLE No. 207.—*Provincial distribution of the area under rubber in India in 1918.*

Provinces.	Acreage.
Burma	63,567
Travancore	32,000
*Madras Presidency	10,062
Malabar	8,783
Salem	214
Nilgiris	1,065
Cochin	8,587
Coorg	6,735
Assam	3,064
*Mysore	215
TOTAL	124,230

* Figures relate to 1917.

The above figures which include land cleared but not fully planted up, may be compared with 220,000 acres in Ceylon, 500,000 in Malaya, 400,000 in the Dutch East Indies and 40,000 in the ex-German Colonies. In Burma it is stated that probably not more than 10,000 acres are actually being tapped, giving an yield of over $2\frac{1}{2}$ million lbs. of rubber. Of the area in Travancore, all under *Para* rubber, large estates account for 26,000 acres and the balance is made up of plots, chiefly small, under cultivation by Indians. About 27,500 acres are being tapped and the outturn at the rate of 250 to 300 lbs. per acre in *1918* has been put at rather more than 8 million lbs. Of the 8,587 acres, also all under *hevea*, actually planted in Cochin, 6,846 acres are being tapped. The acreage in Assam which consists of plantations at Charduar and Kulsi, containing a number of *ficus elastica*, is worked by Government agency. The yield in 1918 was only 1,322 lbs. Of the total acreage in Coorg, 2,721 acres are under *Ceara* (*manihot glaziovii*) and the balance under *Para*, of which 3,541 acres are under bearing. In 1916 new rules governing the grant of lands for rubber planting in Burma were promulgated, which, it is anticipated, will encourage further extensions of the industry, as there are considerable areas believed to be suitable for rubber growing yet unexploited. A royalty is levied on rubber exported from Burma at the rate of 2 per cent. on the net value which is calculated each month on the average value in the London market for the previous month with such deductions as may be prescribed by the Government of Burma on account of the cost of production, freight and sale charges.

Exports.

Exports from India in 1913-14 and 1914-15 aggregated 2,605,000 and 3,676,000 lbs. respectively, of which 1,787,000 and 2,675,000 lbs. were contributed by the Madras Presidency, the bulk of the shipments going from Cochin and Tuticorin. Shipments in the succeeding years are indicated in the following table, the preponderating share of the two ports named being maintained.

TABLE No. 208.—*Exports of rubber, raw, from India and the share of the principal ports from 1915-16.*

Ports.	1915-16.		1916-17.		1917-18.		1918-19.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
		£		£		£		£
Cochin . .	2,149,728	463,556	2,787,897	432,230	2,481,853	331,908	5,232,241	697,672
Tuticorin .	1,433,152	163 212	1,915,049	231,084	2,269,944	300,028	2,999,874	397,722
Mergui . .	669,616	104,834	859,989	104,129	1,027,512	99,326	1,613,650	113,295
Rangoon . .	589,120	95,132	1,327,934	176,839	1,425,443	168,179	2,316,160	185,755
Madras . .	10,528	1,366	2,408	89	412,817	53,602	6,930	770
Calcutta . .	1,456	195	4,704	329	4,592	416	4,115	383
TOTAL	5,273,856	844,482	7,541,307	1,054,419	3,430,089	1,081,289	3,907,123	1,669,527

Burma, the Calcutta trade in Assam 'wild' rubber being almost negligible. The Burma trade is generally divided between Rangoon and Mergui in almost equal shares, though the proportion varies in certain years with larger shipments from Tavoy and Victoria Point. A rubber manufactory which will specialise in solid tyres and mechanical appliances is in course of erection at Calcutta, but its products are intended for the local market and not for export. Shipments of rubber are either in the form of crêpe or sheetings. The shares of the principal recipients in 1913-14, the last pre-war year, and in 1918-19 are contrasted below.

TABLE No. 209.—*Share of the principal recipients of rubber, raw, exported from India in 1913-14 and 1918-19.*

Destinations.	1913-14.		1918-19.	
	Quantity.	Value.	Quantity.	Value.
	Lbs.	£	Lbs.	£
United Kingdom	1,718,752	336,113	10,132,230	1,162,064
Ceylon	784,112	171,664	3,067,688	414,922
Straits Settlements (including Labuan.)	75,264	11,891	75,842	4,698
Holland	22,400	4,169	...	...
United States of America	3,808	529	121,993	1,090
Germany	1,232	120	...	...
TOTAL	2,605,568	524,486	13,907,123	1,669,527

Shipments in 1918-19 indicated an advance of 320 per cent. over those of 1913-14 which were again four times the previous quinquennial average and very nearly double of that exported in 1912-13. Colombo continues to be an important entrepôt for rubber grown in Southern India while Singapore is a similar entrepôt for Mergui rubber. These two recipients with the United Kingdom have continued in subsequent years to appropriate the greater part of the outturn, while the United States of America during 1915-16 and 1916-17 took 219,296 and 414,671 lbs. respectively. For the first time in 1916-17 a consignment of 1,433 lbs. went forward to Japan. The increase in shipments in 1918-19 was very marked in the case of the Madras Presidency, whose exports improved by nearly 70 per cent. both in quantity and value and amounted to 9,726,192 lbs. valued at £1,344,600. A special feature of the year was the shipment of a large quantity to Canada.

Unit of sale and shipment.

The unit of sale is the lb. Shipment is made from Calcutta in bags of 224 lbs. and also in cases of convenient weight. From Burma shipment is made in cases, varying in weight from 175 lbs. nett for high class quality to 200 lbs. for inferior grades. The unit of shipment in Madras and in Cochin is the chest weighing 100 or 200 lbs. Quotations for export are generally based on the lb. *c.i.f.*

COAL.

The greater requirements of shipping in Eastern and Far Eastern waters in the void caused by the disappearance of Welsh coal, and the growing internal demands for industrial purposes have stimulated the production of Indian coal during the last three years.

Production.

The total production in 1917 amounted to 18,213,000 tons, exclusive of the more or less empirical estimate of 364,000 tons taken by the miners for their own use. In 1918 this total rose to over 20 millions. The production and consumption of Indian coal have steadily increased in recent years, particularly since 1906, but the coal resources of the country have not yet been fully exploited. The bulk of the coalfields belong geologically to the Gondwana system from which is obtained 97½ per cent. of the coal won. The Raniganj and Jherria are the two principal coalfields and from them are derived 83 per cent. of the total output. The former lies chiefly in the Burdwan district of Bengal, and the first working dates from 1820, while mining on the Jherria field, which is in the adjoining province of Bihar, began in 1893. Outside these two provinces the most important mine is that at Singareni near Yellandlapad in the Hyderabad State, which was first worked in 1887, the average annual production during the last ten years being 537,000 tons and the output in 1917 nearly 700,000. Other fields of importance are those in the Wardha and Pench valleys in the Central Provinces and the Umaria mine in Rewah State, and of Tertiary coalfields that at Makum in Assam and in the Jhelum District (Punjab) are the most considerable. The output of coal in each of the principal coal-bearing provinces and Native States of India is shewn in the table overleaf.

Value of coal.

The value of the coal produced in India is reported annually by mine-owners and represents the actual or estimated wholesale price of coal at the pit's mouth. The qualities of coal commonly sold on the Calcutta market are *Desherghur* (from the seam of that name which runs through the Raniganj field) and *selected Jherria*. In the following table the average value of all the coal produced is contrasted with that of the declared export value at the ports of shipment.

TABLE No. 210.—*Average value of coal at the pit's mouth contrasted with that declared at time of export.*

Year.	Value at the pit's mouth per ton.	Declared export value per ton.
	Rs. as. p.	Rs. as. p.
1913	3 8 0	9 13 0
1914	3 9 0	8 13 0
1915	3 5 0	9 3 0
1916	3 6 0	9 2 0
1917	3 11 0	9 5 0
1918	4 6 0	10 9 0

TABLE No. 211.—*Production of coal in each province and State of India.*

Year.	British Provinces.							Indian States			General total.
	Assam.	Bihar and Orissa.	Bengal.	Punjab.	Baluchistan.	Central Provinces.	Total British India (all provinces).	Hyderabad.	Rajputana. (Bikaner).	Central India (Rewah).	
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1901-05 (Average)	252,000	..	6,481,000	55,000	39,000	167,000	7,001,000	423,000	28,000	175,000	7,627,000
1906	285,490	5,325,291	3,292,529	73,119	42,164	92,848	9,112,668	467,923	32,372	170,292	9,783,250
1907	295,795	6,487,612	3,505,736	60,749	42,488	134,088	10,526,468	414,221	28,062	178,588	11,147,339
1908	275,224	7,992,372	3,567,539	54,794	45,212	213,789	12,149,020	444,211	21,297	155,107	12,769,635
1909	305,563	7,134,573	3,526,238	37,208	52,449	238,100	11,294,227	442,892	11,449	121,496	11,870,064
1910	297,236	7,041,208	3,737,322	49,189	52,614	220,437	11,398,096	506,173	12,744	130,400	12,047,413
1906-10 (Average)	292,000	6,796,000	3,526,000	55,000	47,000	180,000	10,893,000	455,000	21,000	151,000	11,523,000
1911	294,893	7,610,330	3,858,574	30,575	45,707	211,616	12,051,835	505,380	14,761	143,558	12,715,534
1912	297,160	9,126,385	4,306,129	38,409	54,386	233,996	14,056,515	481,652	18,251	149,921	14,706,339
1913	270,862	10,227,557	4,649,965	51,040	52,932	235,651	15,488,117	552,133	18,781	148,978	16,208,009
1914	305,160	10,661,062	4,424,577	54,303	48,234	244,745	15,738,155	555,991	17,211	152,906	16,464,263
1915	311,296	10,718,155	4,975,466	57,911	43,607	253,118	16,359,632	586,824	17,796	139,680	17,103,932
1911-15 (Average).	296,000	9,669,000	4,443,000	46,000	49,000	236,000	14,739,000	537,000	17,000	147,000	15,440,000
1916	287,315	10,767,683	4,992,376	47,449	42,163	287,832	16,424,893	615,290	13,841	200,285	17,254,309
1917	301,480	11,932,419	4,631,571	49,869	40,785	371,498	17,327,837	680,629	6,045	198,407	18,212,918
1918	294,484	13,679,080	5,302,295	50,418	43,125	481,470	19,851,112	659,122	11,334	199,975	20,721,543

The number of persons engaged in the coal mining industry in 1917 was 167,272, 62,324 above and 104,948 below ground. The classes from which colliery labour is recruited being largely agricultural, supply is adversely affected by a favourable monsoon as the cultivator only turns to mining when his crop has failed and his savings are exhausted. The average annual output per head of labour employed below ground was 169 tons in 1916 as compared with 323 tons in the United Kingdom, but, as has been indicated above, the Indian miner is the product of necessity rather than of inclination. There has been a great advance in recent years in the systematic development of the mines, in a number of which there are now electrical installation for haulage, lighting, pumping and ventilation, but practically no headway has been made as yet in the matter of mechanical coal-cutters.

Labour.

Almost all the coal shipped as private merchandise from India goes from Calcutta, Ceylon and the Straits Settlements being the principal foreign markets. The only other important customer is Sumatra, Sabang being a convenient coaling station for steamers on the Far Eastern run. The total quantities exported from 1913-14 onwards are shewn in the table below with the shares of the principal recipients.

Exports.

TABLE NO. 212—*Exports of coal on private account according to destinations from 1913-14 onwards.*

Year.	Ceylon.	Straits Settlements (including Labuan).	Dutch East Indies.	Others.	TOTAL.
	Tons.	Tons.	Tons.	Tons.	Tons.
1913-14	393,889	183,501	97,652	46,714	721,756
1914-15	392,610	100,636	72,810	26,436	592,492
1915-16	587,691	97,674	84,683	33,910	803,958
1916-17	532,443	144,116	106,809	45,774	829,142
1917-18	153,991	68,595	8,474	24,845	255,905
1918-19	81,310	45,763	8,771	7,783	143,627

The figures of bunker coal and coal on Admiralty and Royal Indian Marine shipping account are not included in the statistics of foreign exports. Of the total shipments of bunker coal in 1917, 486,000 tons went from Calcutta, 931,000 tons from Bombay and Karachi, 53,000 tons from Rangoon and 44,000 tons from Madras.

No very considerable increase in the volume of foreign exports can be anticipated, as the industrial development of India is likely to proceed more rapidly than any prospective increase in coal production. In 1917 about 5½ million tons were consumed by Indian railways, and the shipments on Admiralty and Royal Indian Marine accounts were rather less and of coal for bunkers rather more than 1½ millions. Little or no export on private account was possible during 1918 owing to the absence of freight. Towards the end of the year when freight

was available to a small extent, the Coal Controller declined to allow any but requisitioned coal to leave Calcutta to ensure that none but the very best class of Indian coal should be despatched to foreign markets. The price of this coal was fixed at Rs. 12 (16 sh.) per ton, *f. o. b.* The shipment on Government account from Calcutta for the Admiralty, the Ceylon Government and the Burma Railways in 1918 amounted to 607,674 tons, of which 80,647 was bunker and 527,027 tons cargo coal.

Coke and patent fuel.

Coke is now produced in India to the extent of 500,000 tons a year in the area covered by the Bengal coal field from low-grade coal, but only small quantities are exported. Of the shipments aggregating 1,800 tons on an average annually, Ceylon, the Straits Settlements and Siam take the bulk. There have hitherto been no recorded exports of patent fuel.

Imports.

The imports of foreign coal into India amounted in 1913-14 to 531,814 tons, of which 155,390 tons were from the United Kingdom and the balance chiefly from Natal, Portuguese East Africa, Japan, Holland and Australia. During the war these imports dwindled to 379,000 tons in 1914-15, 115,000 tons in 1915-16 and 48,000 tons in 1916-17. In 1917-18 there was a further drop to 23,600 tons, but there was a revival in the following year to 67,600 tons.

Government control of coal.

The distribution of coal throughout India became a matter of acute difficulty in 1917 on account of the special conditions set up by the war. Before the war the bulk of the coal consumed on the western side of India was carried by sea from Calcutta and the railways serving the coalfields of Bengal and Bihar and Orissa were laid out and equipped for transporting some 3 million tons of coal per year to the Calcutta docks for shipment. When shipping failed, all this coal, with the exception of a very small percentage sent by sea on Admiralty account, had to be transported by rail across India. The burden thrown upon the railways in this respect is illustrated in the table below which exhibits a progressive decrease in the downwards or short-lead rail-borne coal traffic and a progressive increase in the upwards or long-lead coal traffic.

TABLE No. 213.—*Upward and downward despatches of coal by the East Indian and Bengal Nagpur Railways from 1914 to 1918.*

Year.	Upwards.	Downwards.
	Tons.	Tons.
1914	5,298,513	7,894,149
1915	6,132,187	7,132,265
1916	8,084,741	6,391,911
1917	8,493,207	5,753,387
1918	9,476,994	5,582,454

In the first instance a Coal Committee was appointed to deal with the situation which introduced a system of distribution by priority, but as the work in connection with the distribution of coal to industrial

concerns in India, in addition to meeting demands on Admiralty and military account, became heavier and more complicated, the Government of India decided in November 1917 to vest all powers in a single officer designated Coal Controller.

The main difficulty with which the Coal Controller was faced at the outset was a shortage of labour in the coalfields due, among other reasons, to late and very heavy rains and epidemics. He therefore imposed restrictions on the output of a large number of collieries producing the inferior classes of coal in order to prevent labour being diverted from collieries producing better class of coal. Some collieries were restricted as to the monthly tonnage which they might raise and despatch while others were only allowed to manufacture soft coke for domestic purposes.

To save railway wagons for the movement of grain and fodder about India, the Coal Controller also prohibited the transport of brick-burning coal and dust except for purposes of very special importance, and throughout the year 1918 public lighting in the streets of Calcutta and Bombay was reduced to a minimum and shops and places of amusement curtailed their illumination as much as possible.

Requisitioned coal.

A certain quantity of coal was originally requisitioned on Government account at the end of 1916, but the whole output of all collieries working first class coal was requisitioned in June 1917 and, owing to a shortage, the output of a certain number of collieries working second class coal was temporarily placed under requisition early in 1918.

The prices paid for the requisitioned coal varied, but were approximately as follows.

TABLE NO. 214.—*Prices paid for requisitioned coal in 1917 and in 1918.*

Varieties of coal.	1917.	1918.		
		January.	April.	August.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Desherghur, Poniati	5 8 0	5 12 0	6 0 0	6 6 0
Selected Jherrias	4 6 0	4 12 0	5 0 0	5 6 0
1st class „	4 0 0	4 8 0	4 12 0	5 0 0
2nd class „	...	...	3 8 0	3 11 0

Bunker coal.

During 1918 the bunkering of steamers in Bombay, Karachi and Calcutta was also controlled by Government. The prices varied from time to time but were finally fixed as under :—

Calcutta	Rs. 15	per ton *t. i. b.**
Bombay	„ 28	do.
Karachi	„ 27 and 24	do.

* *i.e.,* trimmed into bunkers.

Controlling measures began to be relaxed early in 1919, the initial step being taken in January by the removal of restrictions placed on collieries raising inferior coal, followed in February by relaxing the requisition of coal from second class collieries. A certain quantity of coal in each case was also set free. In April the Coal Controllership was abolished, some part of his duties in connection with the transportation of coal along the railways being carried on by an officer under the Railway Board.

Relaxation of control.

PARAFFIN WAX.

The trade in paraffin wax which is one of the most valuable of the refinery products of petroleum has developed greatly during the last decade with the expansion of the Burma oil industry, and the foreign demand has always absorbed a great deal of the outturn. In 1912-13 the volume of exports exceeded 260,000 cwts. valued at £400,000 and the distribution in the following year is shewn in the annexed table.

TABLE No. 215.—*Distribution of the trade in paraffin wax among principal recipients in 1913-14.*

Countries.	Quantity.	Value.
	Cwts.	£
United Kingdom	84,860	129,408
Japan	38,059	57,724
Australia	34,594	52,472
Cape Colony and Natal	31,682	48,113
Hongkong	30,979	37,479
Germany	20,436	29,339
China	14,461	22,084
United States of America	14,198	21,535
Other Countries	33,884	50,582
TOTAL	303,153	448,736

Early in 1915 the exports of paraffin wax except to the United Kingdom or a British Possession were prohibited, but too late to affect the trade figures for 1914-15 which revealed Japan as the next best customer after the United Kingdom, while the United States and China each doubled the totals of the previous year. In 1915-16 the demand for paraffin wax for munition purposes maintained the volume of exports from Burma, in spite of restrictions and freight shortage, at very nearly the level attained in 1914-15. The United Kingdom took 124,000 cwts. and Japan 63,000 as compared with the absorption in the coastwise trade of 13,000 cwts. only. In 1916-17 there was some relaxation of the embargo and a very largely increased demand for the wax especially from Japan to which country over 100,000 cwts. were shipped, and with these factors persisting, there was a slight appreciation in the aggregate and in the volume of exports to Japan in 1917-18. In

1918-19, on the other hand, scarcity of tonnage to Japan reduced exports to that country to 39,000 cwts., while the restrictions placed in the United States of America on imports lowered that country's share to 4,800 cwts. But there were increased exports to the United Kingdom, South Africa and Portuguese East Africa. The consumption in India continues comparatively insignificant.

TABLE No. 216.—*Exports of paraffin wax (quantities and values) to all destinations from 1913-14 onwards.*

Year.	Quantity.	Value.
	Cwts.	£
1913-14	303,153	448,736
1914-15	373,010	548,135
1915-16	373,589	542,477
1916-17	454,867	677,956
1917-18	484,250	739,901
1918-19	486,476	745,652

Very nearly 95 per cent. of the exports go from Rangoon and the balance from Calcutta.

The unit of sale in Calcutta is the bazaar maund and shipment is made in packages of 168 lbs. Sales are made in Rangoon on the basis of the lb. and the wax is shipped in bags weighing 140 lbs. nett. Quotations for export are generally made per cwt. *c. i. f.*

PROVISIONS AND OILMANSTORES.

Butter.

Of the articles exported from India which fall under this heading the only items of importance are butter and *ghi* the value of which ordinarily makes up three-fourths of the total. Indian butter is generally made either from curdled boiled milk (*dahi*) or from milk that has been only scalded. Climatic considerations practically prevent preparation from the cream of fresh milk as in Europe but, with the development of dairy farming in Western India, cream separators have been introduced in many large towns, and the resultant butter is tinned for internal distribution as well as for the export trade. The centres of this trade are Bombay and Aligarh. Twenty years ago over a quarter of a million lbs. of butter was imported annually. The figures for the last pre-war year were 374,000 lbs. valued at £28,500. Very large quantities of butter obtained from *dahi* are also exported. Buffalo milk is richer in butter than that of the Indian cow. Butter is used by all classes and castes, and the bulk of the supply is home made. No estimate is possible of the proportion of such butter to the total exports.

Exports.

The export traffic has been steadily improving of recent years as the following table will indicate.

TABLE No. 217.—*Quantity and value of exports of butter from India.*

Year.	Quantity.	Value.
	Lbs.	£
1913-14	702,318	38,986
1914-15	551,284	29,660
1915-16	818,311	45,098
1916-17	1,472,471	82,025
1917-18	1,522,880	95,624
1918-19	690,142	48,584

Practically the whole quantity is shipped from Bombay, though inconsiderable quantities go also from Karachi. The principal destinations are Ceylon, Straits Settlements, Zanzibar and East Africa and the Persian Gulf, and in the latter years of the war increasing shipments were diverted to the United Kingdom. In 1915-16 the total exports to this destination were 11,088 lbs. as compared with 336 lbs. in 1913-14, in 1917-18 462,240 lbs. and in 1918-19, 180,580 lbs.

Dairy butter is usually put up in tins of from one to five lbs. and sold by the lb. Country butter is shipped in wooden cases containing two new tins with a capacity of 18 lbs. each, and sold by the cwt.

Ghi.

The internal consumption of *ghi* in India greatly exceeds that of butter. Ghi, which is known as *neyi* in Southern India, is clarified butter prepared by practically every household by heating butter over a slow fire until an oil is formed that rises to the surface while the refuse (mostly casein) settles down as sediment. This oil is then decanted and has the great advantage over butter that it will keep almost indefinitely. Butter loses about 25 per cent. in the process of clarification. The chief producing areas are the United Provinces, Bengal, Rajputana, Central India and the Punjab. Ghi is used for all purposes to which butter is put in Europe and is also extensively employed in the preparation of sweetmeats. Adulteration is largely practised with the aid of vegetable oils like that of coconut, groundnut, nigerseed, poppy and sesame and also with animal fats and starch. The bulk of the quantity produced is locally consumed and supplies are reinforced by a considerable transfrontier trade, as well as by imports by sea from Persia and the Persian Gulf.

Exports.

The export trade nevertheless is of considerable importance as the following table indicates, though the figures include 'imitation *ghi*' which contains about 15 per cent. of pure ghi only and costs less than half the unadulterated article.

TABLE No. 218.—*Quantity and value of exports of ghi from India.*

Year.	Quantity.	Value.
	Lbs.	£
1913-14	5,568,809	232,945
1914-15	4,939,669	193,831
1915-16	5,290,992	205,142
1916-17	5,403,014	221,386
1917-18	5,513,200	252,260
1918-19	4,389,352	235,666

Shipments are not confined to any particular port, though Calcutta accounts for more than 50 per cent. of the traffic, followed by Bombay, Tuticorin and Cocanada in that order. Over nine-tenths of the exports go to British Possessions particularly to those colonies with a large Indian immigrant population, such as the Straits Settlements, Ceylon, Mauritius, Fiji, Natal and East Africa.

Unit of sale and shipment.

The local unit of sale is the bazaar maund, quotations for export being generally made per case containing two new tins weighing 38 seers, either *c.i.f.* or *f.o.b.* This case of two tins is also the common unit of shipment.

TOBACCO.

Cultivation.

The tobacco plant is believed to have been introduced into India by the Portuguese early in the seventeenth century. The only two species cultivated in India are *nicotiana tabacum* in the Peninsula and the yellow-flowered *nicotiana rustica* in Northern India. In Lower Burma and Arakan there is a considerable quantity of tobacco grown from imported Havana seed, and Government since the days of the East India Company has made repeated efforts to improve the indigenous methods of curing and manufacturing and to produce a better quality of leaf. The tobacco industry is now identified with three principal centres.—

(1) Eastern and Northern Bengal and Bihar with headquarters at Rangpur and Monghyr;

(2) Southern India, particularly the districts of Coimbatore, Salem, Trichinopoly, Madura, Kistna, Godavari and Guntur with Madras, Trichinopoly, Dindigul, Palghat and Cocanada as the chief manufacturing and trading centres; and

(3) Lower Burma with Rangoon, Moulmein and Akyab as the principal centres.

The crop is suited only to small holdings as it requires considerable attention and liberal manuring. The area under tobacco in British India is about 1,000,000 acres and the outturn varies according to the attention given to the crop, from 200 to as much as 3,000 lbs. of cured leaf per acre. Though harvesting goes on in some localities as late as June, the bulk of the crop is gathered between February and April. The leaves are dried, sorted and then stacked and allowed to ferment, different qualities of tabacco being produced by varying the degree of fermentation allowed.

Trade varieties.

The best quality of Indian tobacco on the Calcutta market is known as *Rangpur* after the district of that name in which it is chiefly grown. *Poolah* and *bispath* are varieties of Rangpur tobacco, the latter being of inferior quality. Other trade varieties known to exporters are *golden leaf*

from Guntur for cigarette making and *thindoor* and *sindine* from Burma for cheroot wrappers and fillers.

Exports—
(1) Unmanufactured tobacco.

The bulk of the tobacco grown in India disappears in local consumption, but the export trade chiefly from Madras and Rangoon is of considerable value. The total value of the exports of tobacco, manufactured and unmanufactured, in 1913-14 exceeded £319,000, of which roughly two-thirds was unmanufactured. The following table shews the value of India's export trade in unmanufactured tobacco, which for the most part consists of crudely cured leaf, from 1913-14 onwards.

TABLE No. 219.—*Quantity and value of unmanufactured tobacco exported from 1913-14 onwards.*

Year.	Quantity.	Value.
	Lbs.	£
1913-14	27,817,000	211,800
1914-15	16,490,000	144,600
1915-16	24,250,000	201,300
1916-17	27,742,000	253,000
1917-18	20,244,000	238,500
1918-19	31,506,000	549,000

The principal destinations in 1913-14 were Aden and its dependencies, Hongkong, France, Straits Settlements (including Labuan and the Federated Malay States), Holland and Germany. The closure since the outbreak of war of certain tobacco growing areas in Eastern Europe to the Allies has encouraged the export of unmanufactured leaf from India westwards. Burma tobacco is used in the manufacture by the French Government of the *caporal* cigarette, the supplier being on the outbreak of war a German American. Exports to France from Rangoon amounted in 1913-14 to over 3 million lbs. and in 1915-16 to over 6¾ million lbs. In the following year France dropped out of this market altogether but took increased supplies from Bengal. Morocco is another customer for Burma tobacco, her receipts for 1916-17 being 288,000 lbs. as compared with 358,920 lbs. in the previous year. There are also large shipments of unmanufactured tobacco from Burma to Hongkong for the China market. The increase in the export of unmanufactured tobacco to the United Kingdom during the war is ascribed in part to Dutch buyers who gambled on the possibility of being allowed eventual re-export to Holland. In 1918-19, France was by far the largest customer for Indian tobacco, with over 13 million lbs., followed by Aden with 6,400,000 and the Straits Settlements with just over and the United Kingdom a little less than three millions. The share of the various provinces is shewn in the following table. The principal ports participating in the trade were Rangoon, Bombay, Calcutta and Negapatam.

TABLE No. 220.—*Provincial share of exports of unmanufactured tobacco in 1913-14 and 1918-19, contracted.*

Provinces.	1913-14.		1918-19.	
	Quantity.	Per cent.	Quantity.	Per cent.
	Lbs.		Lbs.	
Burma	11,655,612	42	14,552,550	46
Bombay and Sind . .	9,913,490	35½	8,378,717	26
Bengal	4,013,705	14	4,825,657	15
Madras Presidency . . .	2,234,511	8½	3,749,071	13

Unit of sale and shipment.

The unit of sale in Calcutta and in Bombay is the maund of 82 $\frac{2}{15}$ lbs. but in the latter market, the bale of 560 lbs. is also recognised. Shipment is made from the former port in bales of 400 lbs. nett and from Bombay in bales of 2, 2¼ and 5 cwts. each. In Rangoon sales are made per hundred viss of 360 lbs. and tobacco is shipped in bales of 180 to 200 lbs., bundles of 90 lbs. nett or in cases weighing about 365 lbs. nett. In Negapatam the unit of sale is the seer of 24 tolas and tobacco is packed for export in bundles weighing from 28 to 224 lbs.

(2) Manufactured tobacco.

As regards manufactured tobacco the value of the imports has always exceeded that of the exports and the difference has recently been accentuated by the increasing demand for cigarettes on the part of all classes of the population who are no longer content to smoke the indigenous *biri*. This demand has encouraged the opening of a number of factories for the manufacture of cigarettes in India of which the Peninsular Tobacco Company's concern at Monghyr is by far the largest. There are also considerable imports into Bombay and Calcutta of cigars from the Philippines and Havana. The best market for 'Burma' and 'Trichy' cheroots is the Far East, but a limited quantity finds a sale in the United Kingdom. A demand for these cheroots has lately arisen in Mesopotamia and East Africa also, particularly for the South Indian product which is shipped *viâ* Bombay to these destinations. Indian leaf tobacco makes an excellent filler, but is generally unsuitable for wrappers, and to meet this deficiency there is a considerable import of leaf from Sumatra and Java. When the import duty on foreign leaf was enhanced a few years ago the principal factory producing 'Trichy' cigars for export was temporarily transferred to Pondicherry, but they are now manufactured at Dindigul in bond under Customs supervision. Much of the tobacco grown in the east coast districts of Madras is shipped to Rangoon for conversion into Burma cheroots, though there is a good deal manufactured in Cocanada for export as well as local consumption. The exports of unmanufactured tobacco from Bengal and Madras to Rangoon

have been increasingly heavy in recent years, the total for 1913-14 being 13,120,000 and 5,480,000 lbs. respectively. The corresponding figures for 1918-19 were 13,650,195 and 1,977,468 lbs. The lowest qualities of Indian tobacco are shipped to Europe for tanning purposes. The chief customers for Indian cigars in pre-war times and in 1918-19 are contrasted below.

TABLE No. 221.—*Principal countries importing Indian cigars in 1913-14 and 1918-19.*

Countries.	Quantity.	
	1913-14.	1918-19.
	Lbs.	Lbs.
Straits Settlements and Federated Malay States	1,602,041	743,672
United Kingdom	86,033	49,417
European Turkey	30,663	...
Siam	14,584	18,424
Gibraltar	13,950	...
Germany	9,506	...
Aden	7,830	1,429
TOTAL	1,733,959	870,644

The largest market is the Malay Peninsula and is likely to continue so. The trade with Gibraltar has apparently been extinguished by the war. The quantity and value of manufactured tobacco (which includes cigarettes and 'other sorts' as well as cigars) exported from 1913-14 will be found in the next table.

TABLE No. 222.—*Quantity and value of manufactured tobacco exported from 1913-14 onward.*

Year.	Quantity.	Value.
	Lbs.	£
1913-14	2,206,000	107,800
1914-15	2,192,000	100,660
1915-16	2,096,000	92,130
1916-17	1,870,000	100,130
1917-18	1,620,000	102,860
1918-19	1,477,000	93,206

The distribution of the trade among the various provinces has not been materially affected by the war as the table below might at first sight suggest, though Burma has undoubtedly made more headway than any other. The Bombay percentage is swelled by despatches of Madras cigars from that port.

TABLE No. 223.—*Provincial share of exports of manufactured tobacco in 1913-14 and 1918-19, contrasted.*

Provinces.	1913-14.	1918-19.
	Per cent.	Per cent.
Madras	45	14
Burma	38	55
Bengal	15	10
Bombay and Sind	2	21

The ports chiefly participating in the trade in 1913-14 were Negapatam (30 per cent.), Moulmein (25 per cent.), Calcutta (16 per cent.), Rangoon (12 per cent.), and Madras (10 per cent.) and in 1918-19, Rangoon (27 per cent.), Moulmein (28 per cent.), Bombay (13 per cent.), Negapatam (9 per cent.) and Calcutta (10 per cent.).

For Indian made cigarettes the principal customers were up to 1914 Zanzibar and East Africa but the war has directed the bulk of this trade to the Persian Gulf, which with Siam has also attracted most of the exports in recent years of other sorts of manufactured tobacco.

MICA.

Area and production.

Five years ago about three-fifths of the world's production of mica was derived from India, the bulk of the balance being contributed by the United States and Canada though German East Africa was making considerable headway. A feature of the war has been the phenomenal development of mica mining in Brazil whose production is now so considerable as to suggest the closure in the near future of American markets to Indian mica. Practically all the mica mined in India is muscovite, though small quantities of phlogopite are won in Travancore.

Muscovite mica is obtained from two principal areas (1) the Bihar mica belt, a strip of country about 12 miles broad and 60 to 70 miles long, running obliquely across the districts of Hazaribagh, Monghyr and Gaya in the province of Bihar and Orissa and (2) the Nellore District of the Madras Presidency. In addition there are small workings in Ajmer, Udaipur, Mysore and Orissa. It is impossible to give accurate figures of production from these different fields, which differ considerably not only in the quantity but also in the quality of their output. In 1917 the output of dressed mica from Bihar was estimated at 1,700 tons, from Nellore at 300 and from Rajputana at 36 tons, but these figures are probably conservative, and do not include considerable quantities won on which no royalty has been paid. Bihar mica exported from Calcutta is principally of the *ruby* variety, the higher qualities of which known as *clear* and *slightly stained* are regarded as the finest micas in the world and are of great importance in certain electrical industries for their high dielectric co-efficient. Nellore micas is principally *green* mica and is shipped from Madras, while Rajputana mica, which is exported from Bombay, is of much lower quality. The following statement gives

the quantities and average values per cwt. of mica shipped from each area in the years 1913-14 and 1918-19.

TABLE No. 224.—*Quantities and average values per cwt. of mica shipped from the principal ports in 1913-14 and 1918-19.*

Ports.	1913-14.		1918-19.	
	Quantity.	Average value per cwt.	Quantity.	Average value per cwt.
	Cwt.	£ s. d.	Cwt.	£ s. d.
Calcutta	41,313	5 14 7	46,446	11 9 3
Madras	10,871	5 3 9	8,108	6 16 10
Bombay	1,707	5 10 1	1,438	7 13 5
TOTAL	53,891	5 9 6	55,992	10 13 11

The following statement compares the quantities and average values per cwt. of Indian mica imported into the United Kingdom with the quantities and average values of mica from the United States of America and Canada.

TABLE No. 225.—*Quantities and values of imports into the United Kingdom of Indian mica contrasted with those from the United States of America and Canada.*

Country of Origin.	1913.		1914.		1915.		1916.		1917.	
	Quantity.	Average value per cwt.	Quantity.	Average value per cwt.	Quantity.	Average value per cwt.	Quantity.	Average value per cwt.	Quantity.	Average value per cwt.
	Cwt.	£ s. d.	Cwt.	£ s. d.	Cwt.	£ s. d.	Cwt.	£ s. d.	Cwt.	£ s. d.
British India	40,178	3 11 7	24,509	3 17 2	29,534	3 2 4	43,432	4 11 2	48,982	7 3 5
Canada	1,383	6 9 6	1,225	6 4 3	1,864	3 5 0	879	8 12 9	444	13 1 6
United States of America.	889	1 3 0	1,845	1 7 8	4,355	0 16 10	1,628	1 8 2	663	2 7 7

Mining.

The methods of mining in Bihar and Nellore are not identical. In the latter field, owing to the flat nature of the ground, will be found large open quarries, while in Bihar, where the surface is irregular, veins are followed up by winzes, shafts, stopes and drives. Exploitation has often been haphazard and uneconomical, but some of the wealthier firms engaged in the industry have during the last four or five years introduced more scientific methods, and labour-saving machinery has been successfully introduced to assist the inadequate supply of local labour. The mining methods employed were for a long time primitive but latterly improvements have been introduced, and water and débris are now largely removed by mechanical appliances. Altogether mica mining in India gives employment to about 15,000 persons.

Preparation for market.

After being raised to the surface, mica has to be prepared for the market. Madras mica is *shear-trimmed* into rectangular plates, while Bihar mica is *sickle-*

dressed, i.e., trimmed by means of the country sickle. This metho produces irregular shapes as all cracks and flaws are cut out, bu is also less wasteful, for it leaves no square corners to fra out, the blocks are more easily split and it has this additiona advantage that sickle-dressed mica is not considered as 'manufacture mica' for tariff purposes, on import into the United States of America After trimming with the sickle, Bihar mica is sized, a process which i based on the greatest number of square inches which can be measure as a rectangular figure, the irregularities due to cutting being left ou of account. The largest size is known in the trade as 'extr special' (over 48 sq. inches), while blocks containing from 36 to 48 sq inches are classed as 'special' and below that there are seven grades the lowest (No. 7) being of 1 sq. inch only. Each size is then grade according to quality—*clear, slightly stained, fair stained, heavil stained, black spotted*, etc.

Scrap mica.

Originally the smaller sizes of mica had little or no commercial value and these with the trimmings and other wast were dumped close to the mine or factory The installation of grinding plants to convert these trimmings into boile and pipe lagging, etc., has hitherto been scarcely attempted in Indi in the absence of an assured market for their production though the form part of the equipment of almost every mine of any size in America The dump heaps which are found scattered all over the mica field must contain a certain proportion of mica of commercial value, thoug much of it is too weather stained to find a ready market; but extension of the uses of waste mica may in the future enhance their value.

Micanite.

For the disposal of the smaller sizes of mica a solution is offered in the manufacture of micanite, an American invention dating from 1892, but not exploited on a commercial scale until 1905. For the manufacture of micanite mica plates of small size (generally No. 5 and No. 6 block) are split by means of sharp pointed knives into thin flakes which, with the aid o shellac dissolved in spirit, are cemented together under pressure and built up into sheets of any required size and thickness. The varieties most commonly known are micanite 'board,' 'cloth' and 'paper.' The micanite is steamed, rolled and trimmed and finally shaped. Fo the preparation of splittings from mica block, women and children are extensively employed in the mica fields. With her vast supplies of mica, her monopoly of shellac and her cheap labour, India will doubtless in the near future make considerable progress in the manufacture of micanite, which has already been made experimentally at Kodarma, the centre of the Bihar mica industry and in the East Indian Railway workshops at Jamalpur. There is no reason also why condenser plates, funnels and other mica manufactures should not be undertaken in India.

Exports.

At present exports are chiefly in the form of block mica and splittings which are packed in boxes lined with pape and calculated to weigh about 1 cwt. nett each,

the unit of sale being the bazaar maund in Calcutta and the cwt. in Madras. Quotations for export are generally based on the lb. *f. o. b.* The following are the statistics of exports of mica from India during the last six years.

TABLE No. 226.—*Exports of mica from India from 1913-14 onwards.*

Year.	Quantity.	Value.
	Cwts.	£
1913-14	53,891	302,564
1914-15	32,972	191,066
1915-16	33,717	208,496
1916-17	59,[illegible]21	341,255
1917-18	65,729	575,285
1918-19	55,992	598,971

Distribution of the trade.

The internal consumption of mica in India is very small and probably does not exceed two or three hundred tons per annum. Of the principal ports participating in the export trade the percentage shipped from Calcutta in 1918-19 was 83, from Madras 14 and from Bombay 3. In 1914 Germany held a predominant position in the electrical industry and the world's mica market was about to be transferred from London to Hamburg. The distribution of the trade according to the Custom House statistics would suggest that nearly 60 per cent. of the whole went to the United Kingdom, 19 per cent. to the United States and rather less than 16 per cent. to Germany, but not less than half of the shipments to the United Kingdom were re-exported to Germany whose consumption of Indian mica in the calendar year 1913 was 47,000 cwts. in addition to about 10,000 cwts. obtained from her colonies. The outbreak of hostilities suspended the activities of a German merchant who had begun to build up a big business in the mining and shipping of mica from the Nellore field. The mica sent direct to the United States was of higher average value than to other destinations, as only the superior grades can stand the heavy import duty.

The first effect of the war was to discourage the output and diminish the volume of the exports of mica, but a considerable demand soon grew up for Indian mica for munition purposes. To secure adequate supplies for the British Government, exports to destinations other than the United Kingdom were prohibited in September 1915, and in June 1916, a scheme to purchase on Government account was brought into force. The Government of India also took great interest in exploiting mica producing areas hitherto untouched or incompletely developed. The considerable increases in average values recorded during 1917-18 and 1918-19 were due partly to the increased cost of machinery and tools, but largely also to an increase in the proportion of block mica to splittings, which was the result of an increase in the demand for the former for munition purposes.

CHEMICALS AND PREPARATIONS.

Saltpetre.

Area and production.

Saltpetre (potassium nitrate) is in considerable demand for industrial purposes, *e.g.*, in connection with the manufacture of glass, for food preservation, and for manurial purposes in addition to its importance as a constituent of gunpowder. The production of saltpetre in India is practically confined to the areas covered by the three provinces of Bihar, the United Provinces and the Punjab in all of which places the manufacture is controlled under a system of licenses by the Northern India Salt Revenue Department. Farrukhabad in the United Provinces may be cited as the main centre of manufacture though the refined saltpetre produced in the Punjab excels that of any other province. Small quantities sufficient only for local consumption are obtained in Madras as well and in a few Native States in the north. With the outbreak of the war the Indian output was stimulated by a reduction of license fees for crude manufacture and the opening of fresh areas for the production, and other concessions to encourage manufacture. Later on the export of saltpetre exceeding 10 per cent. refraction (impurity) was prohibited and the export of saltpetre of lower refraction restricted to the United Kingdom, at prices subject to fixed maxima. The number of refineries increased from 327 in 1913-14 to 453 in 1917-18 while the number of licenses in the three provinces rose from 31,191 to 51,830. 72 per cent. of the licenses for preparing crude saltpetre were granted in Bihar in which province 55 per cent. of the refineries are situated. The production of refined saltpetre in factory maunds (of 74·67 lbs. each) may be indicated by the following statement.

TABLE No. 227.—*Production of refined saltpetre in factory maunds of 74·67 lbs.*

Year.	Bihar.	United Provinces.	Punjab.
	Factory maunds.	Factory maunds.	Factory maunds.
1913-14	185,373	169,756	87,010
1914-15	222,123	188,396	106,176
1915-16	219,565	236,658	152,301
1916-17	241,038	300,566	245,976
1917-18	230,431	258,838	156,058

The fall in 1917-18 is due to abnormal rainfall during the manufacturing season.

Manufacture.

Crude saltpetre is extracted from nitrous earths scraped during the dry season from the roads, walls, etc., in and around villages where a large quantity of nitrogen is derived from the excreta of men and animals and decayed vegetable matter. This earth is laid in shallow filter beds of clay and

water poured over it, and the resulting liquor after settling is concentrated in large open pans over a slow fire (as in the United Provinces and Bihar) or evaporated by solar heat (as in the Punjab), crystallizing out in the form of crude saltpetre which contains a considerable admixture of common salt. The terms of the license issued to the *nooniah* (crude saltpetre licensee) do not allow him to carry the process any further. Refining is carried out in licensed premises either by continuing the process applicable to the manufacture of crude saltpetre till the education of the salt mixed up with it, or by heating to boiling point a solution of crude saltpetre, when the potassium nitrate dissolves and the common salt contained in it crystallizes out. By evaporating the remaining solution, fairly pure saltpetre may be obtained. The process chiefly in vogue in the Bihar refineries is the former, and the product so obtained is known as *kuthia*. It has a refraction of from 20 to 40 per cent. and a good demand for it exists for manurial purposes and for the manufacture of fertilizers. A much more highly refined article is produced in the Punjab with a refraction in the neighbourhood of 4 per cent., while in Bihar anything better than 8 per cent. is seldom achieved. The crude product of the United Provinces and Bihar yields as a rule from 40 to 50 per cent. refined saltpetre, but the percentage in the Punjab is no more than 30.

Exports.

Up to the year 1860 India enjoyed a monopoly in the saltpetre trade when artificial manufacture from the nitrate deposits of South America and German potash knocked the bottom out of the export trade which fell from 35,000 tons in 1859 to 13,400 tons in the last pre-war year. India's chief customers were the United States of America, China, the United Kingdom, Mauritius and Ceylon. The two last named require high refraction saltpetre for manurial purposes and China, better quality Farrukhabad and Punjab refined saltpetre for fire-works.

TABLE No. 228.—*Destinations and quantities of saltpetre exported from 1909-10 to 1913-14.*

Countries.	1909-10.	1910-11.	1911-12.	1912-13.	1913-14.
	Tons.	Tons.	Tons.	Tons.	Tons.
United States of America	5,421	4,449	2,927	2,827	1,390
China	4,114	4,275	4,329	4,312	4,034
United Kingdom . .	3,807	3,050	2,329	2,361	2,464
Mauritius . . .	2,031	2,530	1,874	2,261	1,437
Ceylon	980	1,142	1,463	2,223	2,224
All other countries . .	1,558	936	806	854	1,854
TOTAL .	17,911	16,382	13,728	14,838	13,403

With the outbreak of the war, the trade was mainly diverted to the United Kingdom, whose chief sources of supply, Germany and Belgium, had been cut off and the Ministry of Munitions looked to India to meet its constantly increasing demands. Whereas the share of the United

Kingdom was 55 per cent. in 1914-15, it was 80 per cent. in 1915-16, and in 1916-17, when the new restrictions on export became effective, 87 per cent. Small quantities were permitted to go to Australia and New Zealand for meat preservation and to Mauritius and Ceylon for manurial purposes, but with this exception India's whole output of saltpetre has been secured for the use of British or Allied manufacturers of munitions.

Prices. The following table illustrates the range of prices for saltpetre of 5 per cent. refraction from 1897.

TABLE No. 229.—*Price of saltpetre of 5 per cent. refraction from 1897 to 1916.*

Year.	January.		July.	
	Rs. as.	*s. d.*	*Rs. as*	*s. d.*
1897	6 1	*8 1*	6 4	*8 4*
1902	6 11	*8 11*	7 0	*9 4*
1907	8 4	*11 0*	9 8	*12 8*
1912	11 4	*15 0*	11 8	*15 4*
1913	11 12	*15 8*	11 8	*15 4*
1914	12 13	*17 1*	11 4	*15 0*
1915	11 12	*15 8*	11 4	*15 0*
1916	13 4	*17 8*	15 8	*20 8*

Early in 1916 owing to a marked rise in prices as a result of market manipulation for the benefit of the middlemen rather than of the manufacturer, the Government of India intervened and fixed maximum rates for exports, *viz.*, Rs. 13-12 (18*s.* 4*d.*) for a factory maund of 5 per cent. (or less) refraction and Rs. 12-14 (17*s.* 2*d.*) for 10 per cent. refraction *f. o. b.*, the refraction values being determined by the Chemical Examiner, Calcutta Custom House, upon samples drawn from the consignments which were under Customs control; but there is reason to believe that there was a good deal of evasion practised in order to defeat these restrictions.

The revision of these rates was under consideration when the armistice was declared and with it the United Kingdom's demand for munition purposes ceased. All restrictions on the export of saltpetre of all grades to non-prohibited destinations have since been removed.

TABLE No. 230.—*The exports of saltpetre (quantities and values) to all destinations from 1913-14.*

Year.	Quantity.	Value.
	Tons.	£
1913-14	13,400	205,600
1914-15	16,400	285,600
1915-16	20,700	459,120
1916-17	26,400	703,690
1917-18	22,680	591,570
1918-19	23,900	621,660

Practically all the shipments have been made from the port of Calcutta. The local unit of sale is the factory maund but sterling quotations to the United Kingdom are per ton *c. i. f.* The unit of shipment in Calcutta is the bag of 224 lbs. nett, but shipment is made from Bombay in bags of 168 lbs. gross also.

Borax.

Imports.

Borax (sodium bi-borate) is not found in British India but is obtained in conjunction with salt on the banks of certain lakes in Tibet or as a deposit in conjunction with sulphur of certain hot springs in Ladakh, Kashmir. The latter supplies enter India generally *viâ* Kulu and are refined at Sultanpur, or alternatively through Chamba to Kashmir and Lahore, while *tincal,* the Tibetan product which constitutes ninetenths of the trade is brought into the United Provinces by Bhutia traders and is refined at Ramnagar. The transfrontier imports of borax in recent years have been in the nighbourhood of 25,000 cwts. yearly, the figures for 1917-18 and 1918-19 being 25,618 and 25,476 cwts. respectively. The annual imports of refined borax by sea, chiefly from the United Kingdom, average about 5,000 cwts.

Exports.

The export (strictly re-export) trade has been steadily declining in recent years owing to the discovery of inexhaustible supplies of calcium borate in Nevada and California, but the internal consumption for medicinal purposes and as a mordant in dyeing and calico printing and other industrial purposes has somewhat increased, the balance struck by deducting shipments from the sum of the transfrontier and sea-borne imports giving a total of about 25,000 cwts. per annum.

The quantity and values of borax exported during the last six years are shewn in the following table.

TABLE NO. 231.—*Quantity and value of exports of borax from India from 1913-14 onwards.*

Year.	Quantity.	Value.
	Cwts.	£
1913-14	4,270	5,131
1914-15	4,461	6,191
1915-16	6,252	10,010
1916-17	7,353	14,102
1917-18	2,873	5,875
1918-19	4,939	10,634

The principal pre-war destinations were the Straits Settlements and Hongkong and the war has not generally affected the distribution of the trade. Over 90 per cent. of the exports have always gone from

Calcutta. The unit of sale in Calcutta is the bazaar maund and shipment is made in cases weighing 1 cwt. each. Quotations for export are per maund *f. o. b.*

RAW SILK.

Producing areas.

There are three tracts in India in which sericulture is still a cottage industry of some importance, (1) the southern portion of the Mysore plateau with the adjoining *taluk* of Kollegal in the Coimbatore District of the Madras Presidency, (2) the Murshidabad, Malda, Rajshahi, and Birbhum districts of Bengal, (3) and Kashmir and Jammu with the neighbouring submontane districts of the Punjab and North-West Frontier Province in all of which the mulberry feeding silk worm (*bombyx mori*) is cultivated. There is also a considerable cultivation in Chota Nagpur and Orissa and parts of the Central Provinces of the *tasar* silk worm and in Assam of the *muga* and *eri* silk worm. All these are purely indigenous. The *tasar* is a wild silk worm never successfully domesticated ; the *muga* is a semi-domesticated silk worm feeding in the open chiefly on two particular species of laurel ; while the *eri* is a domesticated silk worm feeding on castor, the silk from which cannot be reeled but has to be carded and spun. Both in Bengal and Southern India the silk is the produce of a multi-voltine worm fed on the leaves of the shrub mulberry. The Mysore industry, supposed to have been started by Tippu Sultan with seed received from China, with that in the adjoining district of Coimbatore, is now responsible for two-thirds of the total output of silk in India. A good deal of experimental work has been done in Bengal and Mysore in recent years under the direction of French and Japanese experts, and the area of land under mulberry cultivation in Bengal has been found to have increased by 33 per cent. since 1913. In Kashmir, where mulberry trees are abundant and the historical records of the industry go back to the sixteenth century, only uni-voltine worms chiefly from seed imported every year from France and Italy are now grown. The industry is a State monopoly, and yields a net revenue of about £70,000 per annum and the only limit to its expansion is the amount of food available for the worms. The output of silk in Kashmir is on a conservative estimate 200,000 lbs. of reeled silk annually, the whole of which is exported. In the Murshidabad District are several filatures under European control, but there are in India actually only two filatures working on European lines, one in Bangalore and one in Srinagar. Of the filatures in which indigenous methods are employed, there are five establishments in Murshidabad District employing a hundred or more operatives, and one in Jammu.

Production.

Mr. Lefroy's estimate of the production of mulberry silk in India in 1916 when the reeling industry in Kashmir had not completely recovered from the disastrous fire which destroyed the Srinagar filature in 1913, is given in the table below.

TABLE No. 232.—*Estimated production of mulberry silk in India in 1916.*

Provinces.	Quantity.
	Lbs.
Mysore	1,152,000
Bengal	600,000
Madras	400,000
Kashmir	96,000
Burma	15,000
Assam	12,000
Punjab	1,800
TOTAL	2,276,800

It has been calculated that it takes 12 maunds of cocoons to yield one maund of reeled silk.

Exports.

In the early days of the East India Company silk was an important article of the export trade from Bengal and in the time of Warren Hastings the exports averaged over 500,000 lbs., it is believed, of reeled silk alone; but the trade was subject to great fluctuation. Between 1866 and 1874 the average annual exports amounted to over two million lbs. including not only reeled silk but also *chasam* (silk waste) and cocoons. The average exports for decennial periods, from the statistical year 1864-65 onwards, are shewn in the following table.

TABLE No. 233.—*Exports of raw silk during decennial periods from 1864-65 onwards.*

Average for ten years.	Exports of raw silk.
	Lbs.
1864-65 to 1873-74	2,065,272
1874-75 to 1883-84	1,401,025
1884-85 to 1893-94	1,744,109
1894-95 to 1903-04	1,717,601
1904-05 to 1913-14	1,740,023

The above figures would suggest that since 1884 the trade had remained very steady, but unfortunately the proportion of reeled silk in the total (except for a temporary recovery in 1906-07 and the following year) has greatly declined and with it the average value of the whole. There was a remarkable fall in 1913-14 to 160,222 lbs., as compared with 382,081 lbs. in 1912-13 but this was largely ascribable to the Srinagar fire in July 1913 in consequence of which the exports from Kashmir in the following year were chiefly in the form of cocoons. In 1914-15 the effect of the war was greatly felt, as so much of the trade is in normal times with Southern France. The exports of raw silk, *chasam* and cocoons from India during the last six years are shewn in the

following table. With higher prices and a larger demand from France in 1918-19 there was something of a recovery in the shipments of reeled silk and a corresponding fall in the volume of cocoons exported.

TABLE NO. 234.—*Quantity of exports of raw silk, chasam and cocoons from India during the last six years.*

Articles.	1913-14.	1914-15.	1915-16.	1916-17.	1917-18.	1918-19.
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
Raw silk . .	160,222	82,712	125,166	218,636	191,515	290,989
Chasam . .	909,077	347,754	793,120	799,038	428,323	551,299
Cocoons . .	133,789	85,816	344,517	526,429	185,656	112,680

The principal destinations throughout the period were France and the United Kingdom, the demands of Italy and the United States being intermittent and uncertain. The chief ports participating in the trade were Karachi which in the last ten years has superseded Bombay as the principal entrepôt for the Kashmir trade (though there are still considerable exports from Bombay), Calcutta for Bengal and Assam silk, and Madras for *chasam* and cocoons from Mysore, shipments of raw silk having ceased since 1906-07.

Unit of sale and shipment.

In Karachi the unit of sale is the lb. and of shipment the bale of 165 lbs. (two standard maunds nett) while in Calcutta raw silk is sold by the factory seer and shipped in bales of 150 lbs. each. *Chasam* is shipped in 300 lb. bales. Mysore *chasam* is sold per maund of 25 lbs. *f. o. b.* Madras, for shipment to France and Italy and packed for export in pressed bales of 3 cwts. *C. i. f.* quotations to the United Kingdom are generally per lb. and for France per kilo.

SILK MANUFACTURES.

Industrial centres.

The decrease in the exports of silk manufactures from India has been even more noticeable in recent years than that of raw silk. At the same time there is reason to think that the indigenous silk weaving industry is with the aid of imported silk more than holding its own except in Burma. The census returns of 1911 indicated an increase of 28,000 to the total of 228,000 persons enumerated in 1901 as engaged in the industry, the chief silk weaving centres being Murshidabad, Tanjore, Benares, Surat, Amritsar, Chingleput, Madura and Mandalay. Further, while the quantity of raw silk annually imported chiefly from Shanghai is about the same as it was fifty years ago, the bulk of the imports consists now-a-days of fine weaving qualities, whereas it was formerly coarse and suitable only for embroidery. In Burma, where the material is worn by all but the poorest of both sexes, the absorption of

silk piecegoods is remarkable, and in that province there is reason to fear that the competition of Japanese manufactures is becoming too strong for the village handlooms. The value of Japanese imports before the war exceeded £300,000 annually. In other parts of India there is a good market for certain superior qualities of hand-woven silk piecegoods with which no power loom products directly compete. Most elaborate patterns are worked out with the aid of dobbies and jacquard harness, and the beautiful silk brocades literally interspersed with metallic threads known as *kincobs* for which Benares and Madura are famous, command a limited market even outside India. While the war lasted, considerable difficulty was experienced by silk weavers in obtaining the necessary supplies of dye-stuff. There are two considerable power mills manufacturing silk goods in Bombay, and one in Calcutta, Ahmedabad and Bangalore respectively, in the two latter cases in conjunction with other textiles.

Raw silk consumption.

The value of foreign silk consumed by weavers in Bombay city and other parts of the Bombay Presidency is estimated at £94,000 annually. 800,000 lbs. is the estimated consumption of raw silk in the Madras Presidency derived as to 360,000 lbs. from Kollegal, 300,000 lbs. from Mysore, 100,000 lbs. from China *viâ* Tuticorin and Bombay, and 40,000 lbs. from Bengal. With this silk worth from £330,000 to £370,000, piecegoods worth nearly £660,000 are produced, of which £640,000 are absorbed in the Presidency, £10,000 go to other parts of India and the remaining £10,000 are available for export.

Exports.

The decline in the exports of silk manufactures has been most marked in the case of Bombay and Bengal but the exports from Madras, which have however always been on a much smaller scale, have latterly somewhat increased. In 1893-94 the total exports from British India were valued at £162,000 and in 1903-04 at £55,000. The figures from 1913-14 onwards are given in the table subjoined. About 50 per cent. of the shipments in 1917-18 were from Madras, 32 per cent. from Bombay and 17 per cent. from Bengal.

TABLE No. 235.—*Quantity and value of silk manufactures exported from 1913-14 onwards.*

Year.	Quantity.	Value.
	Yds.	£
1913-14	566,367	37,740
1914-15	374,764	22,960
1915-16	365,096	22,111
1916-17	419,885	36,353
1917-18	258,364	22,227
1918-19	823,282	82,364

The above table includes goods made of silk mixed with other materials but is exclusive of small quantities of sewing thread and 'other

sorts ' of silk manufactures averaging in the period about 9,000 lbs. in weight valued at £2,000. Shipments between 1914-15 and 1917-18 were greatly affected by the war. In preceding years the principal recipient was the United Kingdom, chiefly in the form of piecegoods, while the French and Levantine markets once very important had for a long time been negligible. In 1918-19 there was a marked development of the trade between Bombay and the Persian Gulf, the exports of mixed silk and cotton goods being £33,000 in excess of those for the previous year and of pure silk piecegoods over £26,000. There have recently been increased shipments of mixed and smaller shipments of pure silk goods. The Madras trade which is probably still affected by freight scarcity is chiefly with the Straits Settlements both for silk-bordered cotton goods and for pure silk stuffs, though Natal and Northern Africa are promising new markets.

In the transfrontier trade there are not inconsiderable exports of silk piecegoods across the borders of Burma to the Southern Shan States, against which may be set similar imports from Siam, and of raw silk from Western China.

BRISTLES AND FIBRE.

Among the other raw materials exported are bristles and fibre for brushes and brooms.

Bristles.

The bristles are chiefly pigs' bristles which are collected in the United Provinces, graded, and either absorbed by the local trade or shipped from Calcutta and Bombay for the foreign market which takes certain qualities for which there is no demand in India. There is a small factory at Cawnpore which, after satisfying all the requirements of the military department, manufactures every variety of household brushes and a very high grade of toilet brushes chiefly with these bristles. A similar factory has recently been started at Indore. Bristles plucked as in the United Provinces from the living animals are rated superior to those obtained from carcasses. The quantities and values of exports are shewn in the subjoined table.

TABLE NO. 236.—*Exports of bristles (quantities and values) from 1913-14.*

Year.	Quantity.	Value.
	Cwts.	£
1913-14	4,093	92,948
1914-15	4,747	92,327
1915-16	3,865	82,586
1916-17	3,728	87,943
1917-18	2,522	92,724
1918-19	2,746	117,897

The chief destination was the United Kingdom and before the war, Germany also to a small extent. In Calcutta the unit of sale is the

bazaar maund but shipment is usually made in cases weighing one cwt nett. In Bombay sales are made by the lb. and bristles are shipped in cases weighing 50 lbs. nett. Sterling quotations are generally per lb. *c. i. f.*

Palm fibre.

Palm fibre is derived chiefly from the palmyra (*borassus flabelliformis*), the bulk of it being exported from Tuticorin and Cocanada to the United Kingdom, to be made up into brooms. It is obtained from the leaf stalks of seedling palmyras which are widely distributed over Southern India, but the only tracts in which the industry is important are the uplands of Kistna and Godavari, and the Tinnevelly District and the Palghat sub-division of Malabar. The fibre is sold and shipped either dyed or undyed after grading into lengths, the principal grades being 15 to 18 inches and over, 12 to 14 inches and 8 to 12 inches. Each consignment should contain equal quantities of each grade. The exports of palmyra fibre during the past six years are shewn in the following table. The volume of the trade has been adversely affected in the last two years by tonnage difficulties, but there has been a steady appreciation of prices.

TABLE NO. 237.—*Quantities and values of palmyra fibre exported from 1913-14 onwards.*

Year.	Quantity.	Value.
	Cwts.	£
1913-14	80,440	89,097
1914-15	80,929	103,991
1915-16	91,008	115,848
1916-17	97,652	133,918
1917-18	53,391	76,763
1918-19	58,374	81,527

Before the war Germany took 37 per cent., Belgium 30 per cent., the United Kingdom 18 per cent. and Holland 7 per cent. of the exports of this fibre. In 1918-19 the percentages of the principal countries participating were : the United Kingdom, 46 per cent., the United States of America 22 per cent., Ceylon, 14 per cent. and Japan 8 per cent. The chief ports of export and the proportionate share of each in the total trade are shewn in the next table.

TABLE NO. 238.—*Distribution of the trade according to ports in 1913-14.*

Ports.	Quantity.	Percentage.
	Cwts.	
Cocanada	32,114	39
Tuticorin	28,009	34
Calicut	14,801	18
Cochin	4,894	6
TOTAL	80,440	100

At Tuticorin the fibre is generally shipped in pressed bales of 300 lbs. nett, but bundles of one and two cwts. are not uncommon. At Cocanada the weight of the pressed bale is 280 lbs. nett and on the Malabar coast the ordinary unit of shipment is the pressed bale of 3 cwts. nett. The unit of sale at Cochin and Tuticorin is the cwt. but sales are made in Cocanada by the candy of 500 lbs.

CANDLES.

Production.

Candles are manufactured either of stearine, or of paraffin wax with an admixture of stearine as at Syriam near Rangoon. In the latter case the purified wax is melted and run direct to the mixing tubs where a percentage of stearine which is generally small, though in some makes as much as 50 per cent by volume, is added, to increase the rigidity of the candle and to impart a skin which it would not otherwise possess on leaving the moulds. The wax is then poured into rows of block tin moulds and supplied with wicks, an average machine being capable of turning out 360 candles every 15 minutes. Stearine candles are manufactured in Calcutta, Madras, Mysore and Bilimora (Baroda State) but the industry has not yet attained any considerable dimensions, as the table below shewing exports of all kinds of candles represents chiefly candles from Burma.

TABLE No. 239.—*Quantity and value of exports of candles from India from 1913-14 onwards.*

Year.	Quantity.	Value.
	Lbs.	£
1913-14	8,395,078	157,890
1914-15	7,991,505	149,840
1915-16	6,224,104	116,822
1916-17	6,548,369	124,015
1917-18	9,516,606	183,440
1918-19	9,787,492	203,648

95 per cent. of the exports go direct from Rangoon though latterly larger despatches have been made from Bombay. The principal destinations are China, Ceylon, New Zealand, United Kingdom, Straits Settlements, Persia and Siam in that order. Sales of paraffin wax candles are usually made by the case of 25 packets for the Calcutta market and of 30 packets for the Madras, Bombay and Karachi markets, the weight of a packet varying with the weight of the single candle. For foreign markets packings are scarcely standardised yet.

DRUGS AND MEDICINES.

Senna.

The senna of the British Pharmacopœia is derived from the leaves of *cassia angustifolia* and the chief source of supply outside the Sudan is the Tinnevelly District of the Madras Presidency.

The plant is cultivated on special plots of land. No estimate of th area under cultivation, however, can be made but it has been state that on dry lands 700 lbs. of leaves per acre and on garden lands unde wells as much as 1,400 lbs. may be obtained. Plucking commence generally 60 days after sowing, the leaves being stripped from the stalk and if the flower buds are nipped off a heavier flush of leaves follow After picking, the leaves are dried in the shade for a week or ten day and the senna is then ready for sale. Between the cultivator and th shipper is the inevitable middleman who mixes the leaves and bags then before selling to the exporter who has therefore to re-sort according t size and quality before baling. The usual season for collection run from June to December.

The volume and value of the exports of senna during the last seve years are shewn in the next table.

TABLE No. 240.—*Quantities and values of exports of senna from 1912-1 onwards.*

Year.	Quantities.	Values.
	Cwts.	£
1912-13	39,566	37,774
1913-14	26,450	26,425
1914-15	15,288	18,565
1915-16	34,280	51,990
1916-17	103,319	202,859
1917-18	38,481	53,585
1918-19	11,990	17,043

Unit of sale and shipment.

Indian senna has a good reputation for quality and price. I pre-war times the principal customers for senn were the United Kingdom, the United State of America, Germany and France. 99 per cent. of the exports of senn go from Tuticorin, the unit of sale at the port being the candy of 50 lbs. and that of shipment, bales of $2\frac{1}{2}$ to $2\frac{3}{4}$ cwts. each.

Nux Vomica.

Nux vomica, which is commercially important as the source of th alkaloids strychnine and brucine, is the name given to the seeds of a deciduous tree widely distributed over India known as *strychno nux vomica.* The fruits are collected between November and Januar and the seeds taken out and dried in the sun, the busy season fo export on the West Coast running from February to the middle of May Shpiments are chiefly from Cochin, Madras, Cocanada, Bombay an Calcutta. Figures for the foreign trade from 1912-13 are given in th following table.

TABLE No. 241.—*Exports of nux vomica from India from 1912-13 onwards.*

Year.	Quantities.	Values.	Average value per cwt.
	Cwts.	£	Shillings.
1912-13	41,518	14,408	6
1913-14	46,149	17,366	8
1914-15	33,161	14,556	8
1915-16	59,225	30,760	10
1916-17	56,148	31,137	10
1917-18	40,180	25,112	12
1918-19	62,158	57,606	18

The chief countries participating in the trade in pre-war times were the United Kingdom, Belgium, Germany, Holland and France. Practically all the Cocanada output went to New York. 'Fair general average of season, Europe cleaning' is the usual quality exported.

Unit of sale and shipment.

In Madras and Cocanada nux vomica is exported in bags containing 182 and 164 lbs. while on the Malabar Coast the unit is a 140 lb. bag. Calcutta ships in ½ cwt. pockets and Bombay in bags of 140 to 168 lbs. gross. The unit of sale in Bombay is the candy of 823 lbs., in Calcutta the bazaar maund and in the South the candy of 500 lbs. or 600 lbs. generally.

Cinchona.

Area and production.

All the varieties of cinchona from which the commercial barks of to-day are obtained are represented in India, namely, *cinchona ledgeriana* (yellow bark), *cinchona succirubra* (red bark) and *cinchona officinalis*, (pale bark) and hybrids therefrom. The plantations were first started in 1862 at the initiative of the Government from seed introduced from South America, but since then private efforts on the part of tea and coffee planters have been responsible for some part of the increased production and consequent fall in price. The price of quinine which was Rs. 20 (£1-6-8) an ounce in 1878 had fallen to Rs. 12 (16 shillings) per lb. in 1890, and practically similar conditions prevailing in Java have kept the price at that level or lower ever since. The main areas in British India to which cultivation is now confined are the Nilgiri Hills, Coorg and the Malabar District in the Madras Presidency and the Darjeeling District of Bengal, the acreage in the two presidencies in 1913-14 being 2,452 and 2,200 respectively. The corresponding figures for 1917-18 were 1,189 and 2,514 acres. There are besides small areas devoted to the plant in Mysore and Travancore. In the latter State the area has fallen from 2,085 acres in 1909-10 to 151 in 1913-14 owing to greater profits being obtainable from tea and rubber. *Cinchona ledgeriana* is the species mainly cultivated in Bengal, while *officinalis* is more frequently grown in Southern India. The whole of the cinchona plantation in Northern India belong to Government, while in Southern India all but 800 acres are in private ownership.

The plant is generally raised from seeds and infrequently from cuttings or layering. The first crop is usually obtained between the third and fifth year after planting by thinning out the plantation, when about 25 per cent. of the trees are uprooted and barked. Proper bark harvesting however does not begin until at least ten years after planting.

Method of marketing.

Harvesting is conducted in one of two ways, either by (1) lopping off branches or uprooting trees, and removing the bark from root-stem and branches, or by (2) coppicing.

Th bark collected in whatever form is either exported or bought by Government. The chief products of the two Government factories at Neduvattam near Ootacamund in the Nilgiris, and at Mungpoo in the Darjeeling District are sulphate of quinine, and cinchona febrifuge. These factories meet to some extent the large internal demand for quinine from malarial stricken areas in India, nearly 192,000 lbs. of quinine being issued by the Bengal factory alone during the three years 1915—18. Sulphate of quinine manufactured in India is now on sale at Post Offices all over the country. In Southern India it is sold in the form of powder in packets costing only a quarter of an anna ($\frac{1}{4}d.$) each, while in Northern India it is distributed in tablet form, containing 20 four-grain tablets put up in small glass tubes.

Extension of the area under cinchona is necessary in order to make the British Empire independent of Java and other foreign sources of supply, and a special investigation has recently been carried out to find suitable localities for new plantations.

Exports.

Exports of the bark which are confined to the United Kingdom average about 600,000 lbs. annually valued at £10,000 before the war. Bengal has no exportable surplus and all the shipments are from Southern India, the principal ports concerned being Tuticorin (55 per cent.), Calicut (41 per cent.) and Cochin (4 per cent.) Exports, chiefly in the form of bark, are sold at a price calculated on the percentage of quinine sulphate contained in each lb., the unit being 1 per cent. Shipment is usually made in bales of 2 cwts. from Tutriorin and of 250 to 300 lbs. from Calicut. In 1917-18 and 1918-19 nearly all the bark from private estates was taken over by Government for quinine extraction at Neduvattam. For such shipments as were effected good prices were obtainable.

TABLE NO. 242.—*Exports of cinchona bark from British India from 1913-14.*

Year.	Quantities.	Values.
	Lbs.	£
1913-14	605,102	8,289
1914-15	642,987	9,567
1915-16	607,807	8,664
1916-17	688,543	11,680
1917-18	40,180	564
1918-19	27,468	706

Imports into India are chiefly in the form of quinine and its salts.

Imports. The total quantities in 1916-17 and 1917-18 amounted to 47,790 lbs. and 65,407 lbs. respectively in addition to 729 lbs. and 3,993 lbs. of bark. Though a good deal came from the United Kingdom and the United States of America, the countries of manufacture, the country of origin of most of these imports was undoubtedly Java.

SUGAR.

India was probably the original home of sugarcane and the area

Production. under sugar is larger than in any country in the world. But the average yield per acre is so low, and the demand from a population that is largely vegetarian so great that the country depends to an increasing extent upon imports of cheap foreign sugar. Until 1906-07 the majority of these imports were of German and Austrian beet sugar; but, though the world prices for sugar, continued to be regulated until the outbreak of war by the price of 88 per cent. Hamburg, cane sugar gradually secured the bulk of the Indian trade and imports of sugar into India in 1913-14 were almost entirely from Java and Mauritius, the figures being 670,330 tons from Java and 142,395 tons from Mauritius out of a total of 899,370 tons. The area under sugar in India in that year was only 2,545,500 acres equivalent to a decline of 8 per cent. on the totals for 1890-91, but the large purchases by the United Kingdom of Mauritius and Java sugar and the apprehended shortage of foreign supplies and rise in values while war lasted made cultivation more remunerative and in 1918-19 a recovery had been made to the acreage of thirty years ago.

The exports of Indian sugar are chiefly in the form of crude molasses

Exports. or *gur* which goes to Ceylon, and the Straits Settlements and Fiji for the Indian population there who prefer this adulterated product to commercial sugar. The trade is in the hands of Indian merchants and the principal ports of export are Vizagapatam, Cocanada, Tuticorin and Bombay. The unit of sale in Bombay is the cwt. In Cocanada sales are made on the candy of 500 lbs and in Tuticorin on the *tulam* of 20½ lbs. Shipment is usually effected from these ports in bags of 1½ or 2 cwts. nett.

TABLE No. 243.—*Exports of sugar, quantity and value, during the last six years.*

Year.	Quantity.	Value.
	Cwts.	£
1913-14	191,930	91,649
1914-15	109,365	58,727
1915-16	85,299	62,786
1916-17	268,162	177,916
1917-18	102,197	107,549
1918-19	241,033	323,245

GUTS AND CASINGS.

Production.

Though it has to contend with many difficulties the Indian export trade in guts and casings is of some importance. The term 'casings' is generally speaking confined to the viscera of cattle, while the viscera of sheep and goats are called 'guts', though the guts of certain sheep are sold salted as casings, as for example of the fat tailed Delhi rams. There is little or no internal demand for casings but it has been calculated that the average exports do not represent more than the viscera of one million animals; while from 10 to 12 million cattle hides, raw or partially tanned, are annually exported. The chief reason for this difference is the difficulty of working up a market for viscera except in cities of considerable size where the meat trade is centred in slaughter houses. *Beparis* may profitably collect the hides of single animals from village butchers or even the hides of cattle which have died a natural death, but deterioration sets in very quickly if casings are not treated immediately after the animal is disembowelled. Climatic conditions for a great part of the year also affect casings more prejudicially than hides. In view of all these considerations it is doubtful whether the volume of trade is capable of much expansion though considerable improvements might be affected in the methods of marketing. Casings are exported either dried or wet salted, but on account of the higher freight charged the bulk of the shipments are dried.

Preparation for market.

Casings are usually purchased direct from the slaughter houses and treated without delay on adjacent premises. After the fat has been carefully cut off they are turned inside out, scraped clean with a wooden scraper and well washed. One of the open ends is then tied and each gut is blown, and when the other end has been tied is sun-dried. When dry they are deflated, bound up in bundles of 100 *klafters** or 200 yards, packed in cases and pressed. A half case usually contains about 10,000 yards and a full case about 20,000 yards. The process is the same in the case of salted casings up to the point of inflation: in lieu of inflation the casings are sorted and packed in casks known as *tierces* in brine. The casks generally used in India are about 40 gallons in capacity and 2½ to 3 tierces go to the ton. Before packing, dry casings are sorted according to the measurement in millimetres of half the circumference, while in the case of salted casings the diameter is measured.

Trade varieties.

Five different varieties of casings are recognised, namely—

(1) *Runners*, the main gut 20 or 30 yards long in whorls open at both ends;

(2) *Middles*, a straight gut with a maximum length of about 4 yards open at both ends;

(3) *Bungs*, a curved gut with a maximum length of about one yard with a bulbous closed end. The bung skin from which gold beaters' skin is obtained is a tissue which is removable from either side of this bulbous end;

* One *klafter* = 1·80 metres or roughly 2 yards.

(4) *Bladders* used chiefly to cover cheese ; and

(5) *Throats* (known in England as *weasands*) about one to three feet in length.

The preparation of bladders is impossible during the rains and they are at other times particularly subject to damage from insects.

Exports of casings.

In the following table are shewn the exports of casings from Calcutta to each foreign country from March 1917 to August 1919. Previous to March 1917 no separate figures for casings were maintained. Indian casings have a fair reputation in the world's market but were not considered in pre-war days so good as those from Southern Russia.

TABLE No. 244.—*Quantity and value of casings exported from Calcutta from March 1917 to August 1919.*

Countries.	1916-17		1917-18		1918-19		1919-20	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	Cwts.	£	Cwts.	£	Cwts.	£	Cwts.	£
United Kingdom	136	1,534	..	..	..	.	9	100
France	..	..	118	196	8	53	456	2,537
Portugal	..	..	173	2,454	35	613	..	..
Spain	..	..	251	3,013	333	4,543	333	4,767
Switzerland	..	..	10	52	..	..	..	..
United States of America	..	..	..	..	..	..	9	100
TOTAL	136	1,534	552	5,715	376	5,310	807	7,504

Guts.

Indian sheep and goat guts are generally of inferior quality. They are usually dried, packed in bundles of one or two lbs. each and shipped in cases containing from 150 to 200 lbs. No standard size is recognised : they are sorted according to colour and are shipped both split and unsplit.

Exports of guts.

In the table below are shewn the exports of guts from Calcutta to each foreign country from April 1914 to March 1918. For the first three years the totals represent casings as well as guts. France has always been the best market for the latter.

TABLE No. 245.—*Quantity and value of exports of guts from Calcutta from April 1914 to March 1918.*

Countries.	1914-15		1915-16		1916-17		1917-18	
	Cwts.	£	Cwts.	£	Cwts.	£	Cwts.	£
Italy	1,673	5,166	647	2,412	112	414	...	...
Germany	604	2,517	...	...	...	...	...	...
Spain	355	3,063	1,009	8,693	823	7,639	...	...
Belgium	221	852	...	...	...	...	...	...
Austria-Hungary	194	1,084	...	...	...	...	...	...
United Kingdom	121	700	335	2,814	18	164	8	7
France	44	367	2,168	7,190	2,597	7,392	696	3,735
Switzerland	...	...	...	...	8	116	18	98
TOTAL	3,212	13,758	4,159	21,109	3,558	15,725	722	3,840

In 1918-19, 156 cwts. were shipped to France. The principal centres in the export trade are Calcutta, Bombay and Madras, but there does not appear to be any trade either in casings or guts in Burma.

TURPENTINE.

Centres of industry.

The turpentine industry in India had only just passed the experimental stage when war broke out, and the reduction in direct imports of American turpentine and *viâ* the United Kingdom gave it an impetus which it is hoped will have lasting results. Even now the distillation of crude resin derived from *pinus longifolia* which abounds in the Himalayas is confined practically to two factories owned by Government, one at Jallo in the Punjab and the other at Bhowali in the United Provinces though a third factory is under construction at Bareilly. That there is an enormous scope for the development of the industry is evidenced by the estimated area under *pinus longifolia* under Government-owned forests which is put at about 400,000 acres, while the acreage under Native States can be scarcely less. Other species of resin-yielding pines are also available in the Himalayas, in the Assam Hills and in Burma, and there is no reason why the ultimate annual production of Indian turpentine should not exceed 1½ million gallons and of rosin (colophony) 400,000 cwts. A French plant modified to suit Indian conditions has been installed at Jallo capable of dealing with 24,000 cwts. of crude resin per annum, though the present yearly distillation does not exceed 16,000 cwts. The output of the Bhowali factory is considerably lower. The tapping season for the pines extends from March to November, the yield being about a cwt. of crude resin per acre which yields at Jallo 70 per cent. by weight of rosin and 3 gallons of turpentine oil. The chief constituents of resin are rosin and turpentine oil, which must be separated from each other by steam distillation. Turpentine is sold in three qualities through agents at Calcutta, Bombay and Karachi working on a commission basis. There is a large demand for turpentine in the patent varnish trades and also in medicine, while rosin is used for shellac adulteration, in paper mills, soap factories and in the production of cheap varnishes.

Production.

The following table shews the production of rosin and turpentine in India from 1907-08 onwards.

TABLE No. 246.—*Quantity of rosin and turpentine produced in India from 1907-08.*

Year.	Rosin.	Turpentine.
	Cwts.	Gallons.
1907-08	4,870	16,036
1908-09	7,230	23,592
1909-10	7,700	24,105
1910-11	6,675	17,051
1911-12	9,040	27,756
1912-13	20,610	60,249
1913-14	20,220	58,503
1914-15	24,960	78,489
1915-16	34,760	111,835
1916-17	43,880	125,663
1917-18	45,950	136,052

In 1907-08 76,525 cwts. of rosin were imported: and in 1913-14 44,788 cwts. In 1917-18 only 31,496 cwts. were imported which is only two-thirds of the Indian output. The exports of rosin from India average about 400 cwts. annually. In 1907-08 333,500 gallons of turpentine were imported and in 1913-14 193,937. In 1915-16 and 1916-17, the figures were 86,700 and 80,000 respectively which is considerably less than the Indian output, and in 1917-18 less than 50,000. The figure for 1918-19 was 65,000 gallons. Though it may be some time before India is in a position to export turpentine in any quantity there is no reason why she should not soon be able to meet her internal needs.

Imports of rosin and turpentine.

PEARLS.

Occurrence.

The only pearl and chank fisheries of any importance in India are in the extreme south of the Peninsula and the Mergui Archipelago. The conch shells which are obtainable in the Ramnad and Tinnevelly districts of the Madras Presidency go chiefly to Bengal to be made into bracelets, armlets and charms. The Mergui pearl fisheries are largely being exploited by Japanese divers. The total value of pearls which passed through the Custom House at Mergui between the years 1912-13 and 1916-17 exceeded £17,000. The imports of pearls chiefly from the Persian Gulf into Bombay, probably exceed £1 million annually, and until an embargo was imposed (chiefly for financial reasons) upon the exports of pearls the trade in Bombay was estimated as in the neighbourhood of £2 millions. This prohibition has now been lifted. There is a brisk if not very valuable trade in Mergui in mother o'pearl and mussel shells, the value of which in 1917-18 and 1918-19 was £7,000 and £10,000 respectively.

PRECIOUS STONES.

India was known to the Romans for its beryls, and in later times the diamond mines of Golconda are believed to have produced the Koh-i-noor, but latterly the only precious stones mined in any quantity have been rubies, sapphires and spinels at Mogok in Upper Burma. The production of these workings in 1916 yielded 209,724 carats valued at £37,513 and in 1917, 198,200 carats valued at £51,831. The smaller and inferior stones are generally sold locally while the larger and better are sent through to the London Office of the Burma Ruby Mines Company. The pigeon blood ruby of Mogok is considered superior to any other in the world. There are some aquamarines found in Sind and the Punjab and sapphires in Kashmir.

PART IX

MISCELLANEOUS

Coinage.

The Indian coinage consists of a pie, the pice (three pies), the anna of four pice and the rupee of sixteen annas. When, as until recently, the exchange value of the rupee was one shilling and four pence, the anna was regarded as the equivalent of the English penny. The weight and fineness of silver coins and the weight and dimensions of the bronze coins minted are shwen in the table below.

TABLE No. 247.—*The weight, fineness and dimensions of silver and bronze coins minted in India.*

Silver Coins.				Bronze Coins.		
Denomination.	Fine silver. Grains.	Alloy. Grains.	Total. Grains.	Denominations.	Standard weight in Grains Troy.	Diameter in milli-metres.
Rupee . . .	165	15	180	Pice . .	75	25·4
Half-rupee . .	82½	7½	90	Half-pice .	37½	21·15
Quarter-rupee or four-anna piece.	41¼	3¾	45	Pie . .	25	17·45
Eighth of a rupee or 2-anna piece.	20⅝	1⅞	22½			

One hundred thousand rupees are known as a *lakh* of rupees and a hundred lakhs as a *crore*.

There are also two anna and one anna nickel pieces in circulation and the issue of nickel coins representing four and eight annas is in contemplation. The one anna piece has a curved edge of twelve scollops, and the greatest diameter is 21 millimetres, and its least diameter 19·8 millimetres. By Act 22 of 1899 gold coins, sovereigns and half sovereigns are legal tender on payment of account at Rs. 15 for each sovereign. Since 1893 Indian mints have been closed to unrestricted coinage of silver for the public. A Royal Proclamation was issued in 1918 establishing a branch of the Royal Mint at Bombay, and pending receipt of the necessary dies, etc., authority was taken by the Gold Coinage Act (Act XIV of 1918) to mint a number of gold *mohurs*, (the coinage of which had been suspended since 1892) for the purchase of the Punjab wheat crop. This, originally a Moghal coin, was equivalent in value to fifteen rupees though it contained 180 grains troy. On its re-issue last year its weight and fineness were reduced to that of an English sovereign, the weight being 123·27447 grains troy, and the standard fineness 11-12th fine gold and 1-12th alloy.

The denominations of currency notes in circulation are Rs. 1, 2½, 5, 10, 50, 100, 500, 1,000 and 10,000.

Weights and Measures.

Weights and measures in India vary not only from district to district but also for different commodities within the same district, and though the railways have given a lead to the adoption of a uniform system, the country is so vast that the differences are likely to persist for many years to come. The principal units in all the scales of weights are the maund, seer and the tola, and the standard weights for each of these are 82·28 lbs., 2·057 lbs. and 180 grains troy. The tola is the same weight as the rupee. In addition to these weights, there is the viss of 3·60 lbs. or 140 tolas and the candy of 500 to 840 lbs. It is not necessary for the purposes of this volume to detail any variations of the weight of the maund, except those which enter into the export trade. It will be sufficient to say that in any particular city there are probably as many different maunds as there are articles to weigh. The only varieties which need be considered in connection with the foreign trade are the Bengal or railway maund already specified, the factory maund of 74 lbs. 10 ozs. 11 drs., the Bombay maund of 28 lbs. and the Madras maund of 25 lbs. In October 1913 the Government of India appointed a Committee to inquire into the whole question, and their majority report, which was presented in the following year, recommended the extension of the railway system based on the 180 grains tola, while the minority report advocated the adoption of the metric system. The views of the Provincial Governments on these reports are still under consideration.

In the table below an attempt has been made to present within a small compass the principal weights and measures employed in the Indian export trade.

TABLE No. 248.—*Principal weights and measures in use in the export trade.*

Name of unit.		British Imperial Value.	Commodities.
GENERAL.			
Tola	180 grains Troy.	......	
Seer (Standard or Railway or Indian).	...	2·057 lbs.	
Seer (Factory) . .	...	1lb 13·5 oz.	
Viss	...	3·60 lbs.	
Maund (Standard or Railway or Indian).	40 seers .	82 lbs. 4 oz. 9 dr.	
Maund (Factory) .	...	74 lbs. 10 oz. 11 dr.	
LOCAL VARIATIONS.			
Calcutta.			
Seer	80 tolas .	2·053 lbs.	
Bazaar Maund . .	...	82 lbs. 2 oz. 2 qr.	
Bombay.			
Seer	27 tolas 40 grains.	11⅕ oz.	

TABLE No. 248.—*Principal weights and measures in use in the export trade*—contd.

Name of unit.		British Imperial Value.	Commodities.
LOCAL VARIATIONS—*contd.* *Bombay*—contd.			
Maund	40 seers	28 lbs. (¼ cwt).	
Maund (Surti)	...	39·2 lbs. (also 29·4, 38·26 and 41·06).	Cardamoms.
Candy	...	11 Bombay maunds=308 lbs.	Coriander seed.
		20 Bombay maunds=560 lbs.	Groundnut, sesame, castorseed, tobacco (unmanufactured).
		21 Bombay maunds=588 lbs.	Wool, raw, turmeric, pepper, chillies.
		22½ Bombay maunds=630 lbs.	Mustard seed.
		25 Bombay maunds=700 lbs.	Myrobalans.
		27 Bombay maunds=756 lbs.	Wheat, barley, jowar, bajra, gram.
		28 Bombay maunds=784 lbs.	Raw cotton, pulse, cotton seed.
		29$\frac{11}{28}$ Bombay maunds =823 lbs.	Nux vomica.
Karachi.			
Seer	80 tolas	2·05 lbs.	
Maund	...	28 lbs.	Hides, raw.
		82$\frac{2}{7}$* lbs.	Oilseeds.
		84 lbs.	Wool.
		86·40	Bone manures.
Candy	...	8 Maunds=656 lbs. (of 82 lbs).	Rice, barley, sesame, wheat.
Madras.			
Maund	...	25 lbs.	Indigo.
Candy	...	500 lbs.	Cotton, raw.
Candy (Dutch)	...	672 lbs.	Copra.
Tuticorin.			
Tulam	...	14 lbs.	Groundnut cake.
		15 lbs.	Chillies.
		20½ lbs.	Sugar.
Maund	...	26 lbs.	Coffee.
Candy	...	500 lbs.	Cotton, raw.
Negapatam.			
Seer	24 tolas or 8 palams	9$\frac{3}{5}$ oz.	Chillies, ginger, etc.
Cocanada.			
Maund	...	25 lbs.	Turmeric.
Candy	...	500 lbs.	Cotton, raw.
Cuddalore.			
Candy (French)	...	530 lbs.	Groundnut.
Cochin.			
Candy	...	600 lbs.	Copra, etc.
Mangalore.			
Seer	24 tolas	9$\frac{3}{5}$ oz.	Sandalwood oil.
Maund	...	28 lbs.	Coconut oil.
		32 lbs.	Copra.
Candy	...	560 lbs.	Sandalwood.

* In practice the fraction is often neglected.

Freights.

The following statement shews the rate per ton for London current at the several ports named during that month of the year in which shipments of the stated article of produce are usually the heaviest.

TABLE No. 249.—*Rates of freight per ton for certain articles from India to the United Kingdom between 1913 and 1918.*

Ports, articles and destinations	1913.	1914.	1915.	1916.	1917.	1918.
	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.
Calcutta.						
Linseed to London or Liverpool. [June]	1 6 3	0 17 6	4 10 0	7 2 6	14 12 6	§8 15 0
Tea to London . [August]	*1 15 0	*1 15 0	2 7 6	2 7 6	3 15 0	6 5 0 (per ton of 40 c. ft.)
Jute to London . [October]	1 8 9	†2 3 9	3 12 0	8 2 6	20 0 0	20 0 0
Bombay.						
Cotton to Liverpool [January].	1 0 0	0 15 6	1 9 0	7 10 0	10 10 0	16 5 0
Seeds to London [December]	0 15 0	0 17 6	3 12 6	10 5 0	10 15 0 (Linseed)	No quotation.
Karachi.						
Wheat to Liverpool. [May]	0 18 6	0 12 6	2 15 0	5 10 0	12 10 0	12 10 0
Madras.						
Hides and Skins to London . [October]	2 0 0	2 8 0	4 10 0	8 15 0	‡3 1 0	‡6 5 0
Groundnuts to Marseilles . [January]	1 17 6	1 7 6	1 17 6	7 15 0	11 0 0	No shipment.
Rangoon.						
Rice to London [February]	1 11 6	1 1 0	2 7 6	8 15 0	14 0 0	‖6 5 0

* Subject to a rebate of 5 shillings.
† Inclusive of 25 per cent, surtax.
‡ Tanned hides per ton of 40 c.f.t., shipped on behalf of War Office.
§ Rate fixed by Ministry of Shipping as only Government shipments allowed.
‖ Controlled rate for Government purchases only.

APPENDIX I.

TONNAGE SCHEDULES FOR STEAMERS.

For the ports of Calcutta, Bombay, Madras, Rangoon and Karachi.

Name of the article.	CALCUTTA.	BOMBAY.	MADRAS.	RANGOON.	KARACHI.
	Per ton nett.	Per ton.	Per ton nett.	Per ton nett.	Per ton.
Aloes	....	In kegs, 40 c. ft.	In bags, 20 cwt. In boxes, 20 cwt	....	In kegs, 40 c. ft.
Alum	....	In bags, 16 cwt.	20 cwt.	....	In bags, 16 cwt.
Aniseed	In bags, 8 cwt.	....	8 cwt.	....	....
Annotto	....	In C/S, 40 c. ft.	....	....	In C/S, 40 c. ft.
Apparel	....	40 c. ft.	50 c. ft.	In C/S, 40 c. ft.	Do.
Arrowroot	....	In C/S. 40 c. ft.	In C/S, 50 c. ft.	In C/S, 50 c. ft.	Do.
Assafœtida	....	In C/S, 40 c. ft.	In bags and boxes, 20 cwt.	....	In C/S, 40 c. ft.
Bajree	....	In bags, 18 cwt.	....	....	In bags, 18 cwt.
Barilla	....	16 cwt.	20 cwt.	....	16 cwt.
Bark	....	....	In bags, 8 cwt.	20 cwt.	....
Barley	20 cwt.	In bags, 15 cwt.	....	....	In bags. 15 cwt.
Beans	....	....	....	20 cwt.	....
Beeswax	20 cwt.	In C/S, 40 c. ft.	20 cwt.	20 cwt. gross.	In bags, 40 c. ft.
Betelnuts	20 cwt.	In bags, 13 cwt.	18 cwt.	20 cwt.	In bags. 13 cwt.
Blackwood	....	In straight square logs, 40 c. ft.	....	....	In straight square logs, 40 c. ft.
		Otherwise, 16 cwt.	....	....	Otherwise, 16 cwt.
Bonemeal, etc.	20 cwt.	Meal and dust, 20 cwt.	....	Bones, loose and bonemeal, 20 cwt.	Meal and dust 20 cwt.
		Meal in bags (in accordance with the average quality of which a standard is preserved by the Chamber), 20 cwt.	....	....	Crushed in bags as per standards kept by the Chamber, (Note 4 on p. 341), 17 cwt., 15 cwt. and 18 cwt.

Name of the article.	CALCUTTA.	BOMBAY.	MADRAS.	RANGOON.	KARACHI.
	Per ton nett.	Per ton.	Per ton nett.	Per ton nett.	Per ton.
Bones .	Crushed 20 cwt. or 50 c. ft. (at Steamer's option).	Crushed in bags as per the Chamber standard.	....	....	Loose, 8 cwt. (See note 4 on p. 341.)
		A 11 cwt.	....	....	....
		B 14 cwt.	....	....	....
		C 17 cwt.	....	....	....
		(See note 2 on p. 340.)			
Books .	....	40 c. ft.	50 c. ft.	50 c. ft.	40 c. ft.
Borax . (or Tincal).	20 cwt.	In C/S, 40 c. ft.	Or Tincal 20 cwt.	....	In C/S, 40 c. ft.
		In bags, 16 cwt.	In C/S, 50 c. ft.	....	In bags, 16 cwt.
Bottles, empty.	....	....	....	40 c. ft.	....
Bran . .	14 cwt.	In bags, pressed, 10 cwt. (See note 2 on p. 340.)	....	20 cwt.	In bags, pressed (See note 4 on p. 341), 10 cwt.
		In bags, unpressed, 9 cwt.	....	......	Unpressed, in bags, 9 cwt.
Brimstone .	....	....	20 cwt.	20 cwt.	....
Bristles .	50 c. ft.	....	....	....	....
Buffalo horns (See horns).	....	In bundles, 6 cwt.	....	....	In bundles, 6 cwt.
Bullion . .	*Ad valorem.*	At per cent.	At per cent.	At per cent.	At per cent.
Camphor .	In C/S, 50 c. ft.	In C/S, 40 c. ft.	In C/S, 50 c. ft.	In C/S, 50 c. ft.	In C/S, 40 c. ft.
Canes or rattans (See also Rattans).	Rattans for dunnage, 20 cwt.	In bundles, 13 cwt.	Rattans, 20 cwt.	Rattans for dunnage, 20 cwt.	In bundles, 13 cwt.
Carbonate of Potash.	50 c. ft.	....	....	....	....
Cardamoms	In robbins, 8 cwt.	In bundles, 40 c. ft.	In robbins, 8 cwt.	In boxes, 8 cwt.	In bundles, 40 c. ft.
	In boxes, 50 c. ft.	....	Boxes, 50 c. ft.	....	....
			Bags, 10 cwt.		
Carpets .	50 c. ft.	....	....	....	....
Cassia .	In bags, 12 cwt.	Cassia lignea, fistula and buds, 40 c. ft.	All sorts, 50 c.ft.	....	Cassia Lignea, Fistula and buds, 40 c. ft.

Name of the article.	CALCUTTA.	BOMBAY.	MADRAS.	RANGOON.	KARACHI.
	Per ton nett.	Per ton.	Per ton nett.	Per ton nett.	Per ton.
Castor seed .	15 cwt.	*Bold Cawnpore* description and mixtures containing more than 2 per cent. of such. 10 cwt. Other sorts not containing more than 2 per cent. of *bold Cawnpore* description 13 cwt.	15 cwt.	15 cwt.	14 cwt.
Chasam .	50 c. ft.	8 cwt.	....	....	8 cwt.
Chillies . .	(Dry) in bags, or bundles 8 cwt.	....	In bags, 12 cwt. In robbins, 14 cwt.	In bags, 8 cwt.	....
Chinaroot .	....	In C/S, 40 c. ft.	In bags, 11 cwt.	In bags, 11 cwt.	In C/S, 40 c. ft.
	....	....	In boxes, 50 c.ft.	....	....
Chiretta .	In bundles, 50 c. ft.	....	50 c. ft.	In bales, 16 cwt.	....
Chrome ore.	20 cwt.	....	....	....	....
Cigars .	....	40 c. ft.	50 c. ft.	50 c. ft.	40 c. ft.
Cinnamon .	....	In C/S, 40 c. ft.	....	....	In C/S, 40 c. ft.
Cloves . .	In bags, 8 cwt.	In C/S., 40 c. ft.	In bags, 8 cwt.	In bags, 8 cwt.	In C/S, 40 c. ft.
	In cases, 50 c. ft.	In bags or frazils, 8 cwt.	In chests, 50 cwt.	....	In bags or frazils, 8 cwt.
Coal . .	20 cwt.	....	20 cwt.	20 cwt.	20 cwt.
Cochineal .	50 c. ft.	....	50 c. ft.	50 c. ft.	....
Cocoa .	....	In bags, 10 cwt.	....	....	In bags, 10 cwt.
Coconut oil (See oil).	....	11 cwt.	....	....	11 cwt.
Coculus Indicus.	....	In bags, 13 cwt.	....	....	In bags, 13 cwt.
Coffee .	In bags, 18 cwt.	In C/S, 40 c. ft.	In bags, 18 cwt.	In bags, 18 cwt.	In C/S, 40 c. ft.
		In bags or frazils, 14 cwt.	In robbins and casks, 16 cwt. In C/S, 17 cwt.	In barrels, 16 cwt.	In bags or frazils, 12 cwt.
Coir .	In dholls, 10 cwt.	In bales, 40 c.ft.	Yarn and fibre, screwed bales, 50 c. ft.	Bundles, 10 cwt.	In bales, 40 c.ft.
		In bundles or loose, 5 cwt.	In bundles and dholls, 10 cwt.	Loose, 12 cwt.	In bundles or loose, 5 cwt.
Coir rope .	....	In coils, 40 c. ft.	....	....	In coils, 40 c. ft.
Coke . .	20 cwt.	....	....	....	....
Colocynth .	....	In C/S, 40 c. ft.	....	....	In C/S, 40 c. ft.
Colombo root	....	In bags, 8 cwt.	....	....	In bags, 8 cwt.
Copper ore .	20 cwt.	....	....	....	....

Name of the article.	CALCUTTA. Per ton nett.	BOMBAY. Per ton.	MADRAS. Per ton nett.	RANGOON. Per ton nett.	KARACHI. Per ton.
Copra or coconut kernel.	12 cwt.	In robbins, 8 cwt.	In bags, 12 cwt.	In bags, 14 cwt.	In robbins, 8 cwt.
		Cut copra in bags, 10 cwt.	In bags, each cup cut in 4 pieces, 14 cwt.	....	Cut, in bags, 11 cwt.
Copra cake or Coconut cake.	20 cwt.	....	....	....	....
Coral	....	Rough (not specimen) in bags, 16 cwt.	....	....	Rough (not specimen) in bags, 16 cwt.
Coriander seed.	12 cwt.	....	12 cwt.	....	....
Corundum ore.	20 cwt.	....	....	....	....
Cotton	50 cwt.	In bales, 40 c.ft.	In bales, 50 c.ft.	In bales, 50 c.ft.	In bales, 40 c. ft
Cottonseed	....	13 cwt. (See note 2 on p. 340.)	....	Cottonseed, 15 cwt.	13 cwt.
				Cottonseed oil, 20 cwt. Cottonseed cake, 20 cwts. gross.	
Cotton in yarn.	....	....	50 c. ft.	....	....
Cotton piece-goods.	....	....	50 c. ft.	....	....
Cowries	20 c. ft.	In C/S, 40 c. ft.	20 cwt.	....	In C/S, 40 c. ft.
		In bags, 16 cwt.	....	....	In bags, 16 cwt.
Cubebs	....	10 cwt.	....	....	10 cwt.
Cumminseed	8 cwt.	In C/S, 40 c. ft.	....	....	In C/S, 40 c. ft.
Curios	....	....	....	40 c. ft.	....
Cutch	In bags, 18 cwt.	And gambier (terra japonica) in bags or baskets unscrewed. 13 cwt.	In bags, 17 cwt.	In boxes, 20 cwt. gross. In bags, 16 cwt.	And gambier (terra japonica) in bags or baskets unscrewed, 13 cwt.
	In C/S, 50 c. ft., not exceeding 20 cwt. gross.				
Cylindrical packages, rolls, etc.	....	40 c. ft. (See note 2 on p. 340.)	....	....	40 c. ft. (See note 4 on p. 341.
Dates	Wet, 20 cwt.	Wet, 16 cwt.	Wet, 20 cwt.	....	Wet, 16 cwt.
	Dry, 16 cwt.	Dry, 13 cwt.	Dry, 16 cwt.	....	Dry, 13 cwt.
Dhall	20 cwt.	Crushed in bags, 17 cwt.	20 cwt.	In bags, 20 cwt.	Crushed or split in bags, 17 cwt.
Dragon's blood.	....	In C/S, 40 c. ft.	....	....	In C/S, 40 c. ft.
Ebony	....	Square and straight, 40 c. ft.	....	....	Square and straight, 40 c. ft.
		Otherwise, 16 cwt.	....	....	Otherwise, 16 cwt.

Name of the article.	CALCUTTA. Per ton nett.	BOMBAY. Per ton.	MADRAS. Per ton nett.	RANGOON. Per ton nett.	KARACHI. Per ton.
Elephants' teeth.	....	In C/S, 40 c. ft.	In bulk, 16 cwt.	In C/S, 50 c. ft.	In C/S, 40 c. ft.
		In bundles, 14 cwt.	In C/S, 50 c. ft.	In bulk, 20 cwt.	In bundles, 14 cwt.
		Loose, 16 cwt.	....	....	Loose, 16 cwt.
Fennel seed.	....	10 cwt.	....	....	10 cwt.
Fenugreek (Methie seed).	....	17 cwt.	16 cwt.	....	17 cwt.
Fibres, all sorts.	50 c. ft.	....	Palmyra fibre, 50 c. ft.	....	....
Fish manure	....	....	....	....	As per sample lodged with the Chamber, 9 cwt.
Fishmaws or Isinglass.	....	....	....	....	In C/S, 40 c. ft.
Flour .	....	In bags, 18 cwt.	....	In bags, 20 cwt.	18 cwt.
		Middlings or sharps in bags, 12 cwt.	....	....	Middlings or sharps in bags, 12 cwt.
Furniture .	....	40 c. ft.	50 c. ft.	50 c. ft.	40 c. ft.
Galingals .	....	10 cwt.	....	....	10 cwt.
Galls . .	....	In bags, 13 cwt.	....	....	In bags, 13 cwt.
		In C/S, 40 c. ft.	....	....	In C/S, 40 c. ft.
Garlic or onions.	12 cwt.	....	12 cwt.	12 cwt.	....
Ghee (ghi) .	....	....	....	....	In dubbas or casks, 40 c. ft.
Ginger .	16 cwt.	Dry in C/S, 40 c. ft.	In bags or bales, 12 cwt.	In bags, 16 cwt.	Dry in C/S 40 c. ft.
		Dry in bags, 10 cwt.	In C/S, 50 c. ft.	....	Dry in bags, 10 cwt.
Gram .	20 cwt.	In bags, 17 cwt.	20 cwt.	In bags, 20 cwt.	17 cwt.
Groundnuts	....	Shelled, 13 cwt.	Shelled, 16 cwt.	....	Shelled, 13 cwt.
		Unshelled, 6 cwt.	Unshelled, 12 cwt.	....	Unshelled, 6 cwt.
Guano .	....	....	....	In bags, 16 cwt.	....
Gums .	In C/S, 50 c. ft.	Of all kinds in C/S, 40 c. ft.	In C/S not enumerated, 50 c. ft.	In C/S, 50 c. ft.	Of all kinds in C/S, 40 c. ft.
		Gum olibanum in bags, 13 cwt. Gum (Persian) in double bags and Gum (Arabic) in double bags, 17 cwt.	Olibanum, 18 cwt.	....	Olibanum in bags, 13 cwt.
Ganja .	50 c. ft.	....	50 c. ft.	50 c. ft.	....
Gunny bags and gunny cloth.	Gunnies, 50 c. ft. or 20 cwt. gross (at steamer's option).	....	50 c. ft.	50 c. ft.	....

Name of the article.	CALCUTTA.	BOMBAY.	MADRAS.	RANGOON.	KARACHI.
	Per ton nett.	Per ton.	Per ton nett.	Per ton nett.	Per ton.
Hemp .	In bales, 50 c. ft.	In screwed bales, 40 c. ft.	In bales, 50 c.ft.	In bales, 50 c. ft.	In screwed bales, 40 c. ft.
		Loose or in bundles, 5 cwt.	....	....	Loose or in bundles, 5 cwt.
Hides and Skins (See also Skins).	In bales, 50 c. ft.	Hides and skins in screwed bales, 40 c. ft.	Hides, 50 c. ft.	Hides, buffalo and cow, 16 cwt.	In screwed bales, hides and skins, 40 c. ft.
		Hides and skins, loose and in small bundles, 40 c. ft.	....	....	Hides and skins, loose and in small bundles, 40 c. ft.
Hide cuttings	In bales, 50 c. ft.	....	....	....	....
Hoofs, horns, etc.	Hoofs, cow and buffalo, Horns and Horn tips, loose, 20 cwt.	Horns, buffalo and cow, loose, 13 cwt.	Hoofs, horn shavings and tips, 20 cwt.	Horns, buffalo or cow, 20 cwt.	Horns, buffalo and cow, loose, 13 cwt.
	Ditto in bags or bundles, 50 c. ft.	Horns, deer, loose, 6 cwt.	Horns, cow and buffalo, 20 cwt.	....	Horns, deer, loose, 6 cwt.
	Horns, deer, in bags or bundles, 50 c. ft.	Horn tips, of any kind, 13 cwt.	Horns, deer, 16 cwt.	....	Horn tips of any kind and hoofs 13 cwt.
		Buffalo horns, in bundles, 6 cwt.	....	....	Buffalo horns, in bundles, 6 cwt.
Hurtall (Orpiment).	....	In C/S, 40 c. ft.	....	....	In C/S, 40 c. ft.
India Rubber	Rubber, in C/S, 50 c. ft.	....	....	In bags, 20 cwt.	....
Indigo .	50 c. ft.	In C/S, 40 c. ft.	50 c. ft.	....	In C/S, 40 c. ft.
Iron (See Metals).	....	Old, 20 cwt.	....	20 cwt.	Old or scrap, 20 cwt.
		Rails, 20 cwt.	....	....	Or steel rails, 20 cwt.
Jack wood (See Timber).	....	40 c. ft.	....	....	40 c. ft.
Jamba (see Rapeseed).					
Jaggery .	....	....	....	....	18 cwt.
Jawar .	....	In bags, 18 cwt.	....	....	In bags, 18 cwt.
Jute . .	50 c. ft.	....	In bales, 50 c.ft.	50 c. ft.	....
Kapok .	50 c. ft.	....	....	....	....
Kapok seed.	15 cwt.	....	....	....	....
Khorassan .	....	....	....	....	16 cwt.

Name of the article.	CALCUTTA.	BOMBAY.	MADRAS.	RANGOON.	KARACHI.
	Per ton nett.	Per ton.	Per ton nett.	Per ton nett.	Per ton.
Lac . .	Button, seed, stick and shellac, in bags, 16 cwt.	Lac dye in shells or C/S, 40 c. ft.	Cake lac in bags, 16 cwt.	Stick lac in bags, 16 cwt.	Lac dye in shells or C/S, 40 c.ft.
	Button, seed, stick and shellac, in cases, 50 c. ft.	....	Lac dye, 50 c. ft.	Shellac in C/S, 50 c. ft.	Lac (seed) in bags, 13 cwt.
	Kiri lac or lac refuse, in bags, 20 cwt.	....	Seed lac in C/S, 50 c. ft.	Seed lac in C/S, 50 c. ft.	....
	Lac dye, in cases, 50 c. ft.	....	Seed lac in bags, 16 cwt.	Lac dye, 50 c. ft.	....
		....	Shellac in C/S, 50 c. ft.	Cake lac in bags, 16 cwt.	....
		....	Shellac in bags, 16 cwt.	....	....
		....	Stick lac in C/S, 50 c. ft.	....	....
		....	Stick lac in bags, 16 cwt.	....	....
Lang (Vetch)	....	In bags, 18 cwt.	....	....	In bags, 18 cwt.
		Crushed in bags, 17 cwt.	....	....	Crushed in bags, 17 cwt.
Lard . .	20 cwt.	....	50 c. ft.	....	....
Leather .	In cases or bales, 50 c. ft.	....	....	....	....
Lentils .	20 cwt.	....	....	....	20 cwt.
Linseed .	20 cwt.	In bags, 16 cwt.	18 cwt.	20 cwt.	In bags, 16 cwt.
Mace .	....	In C/S, 40 c. ft.	In C/S, 50 c. ft.	....	In C/S, 40 c. ft.
Machinery .	....	....	20 cwt.	20 cwt.	....
Maize .	20 cwt.	In bags, 16 cwt.	....	20 cwt.	In bags, 17 cwt.
Manganese .	20 cwt.	....	....	....	....
Metals (See Iron separate).	....	....	20 cwt.	20 cwt.	....
Methic seed (*vide* Fenugreek).					
Mica (See Talc).	....	....	....	....	....
Millets .	....	....	....	20 cwt.	....
Molasses	20 cwt. gross.	....	20 cwt.	2 puncheons or 4 hhds.	....
Mother o' pearl.	In bags or cases, 20 cwt. gross.	In C/S, 40 c .ft.	In bags, 20 cwt.	....	In C/S, 40 c. ft.
		In bags, 16 cwt.	In chests, 20 cwt.	....	In bags, 16 cwt.

Name of the article.	CALCUTTA. Per ton nett.	BOMBAY. Per ton.	MADRAS. Per ton nett.	RANGOON. Per ton nett.	KARACHI. Per ton.
Mowra .	Seed, 20 cwt.	Flowers, 18 cwt.	....	....	Flowers, 18 cwt.
		Seed in bags, 13 cwt.	....	....	Seed in bags, 13 cwt.
Mutter . (*Dhal*).	....	....	....	....	18 cwt.
Munjeet . (Dye).	Dye, in cases, 50 c. ft.	Or Madder root in C/S. or bales, 40 c. ft.	50 c. ft.	....	Or Madder root in C/S or bales, 40 c. ft.
		Or Madder root in bundles or bags, 8 cwt.	....	....	Or Madder root in bundles or bags, 8 cwt.
Musk .	....	In C/S, 40 c. ft.	....	....	In C/S, 40 c. ft.
Masur . (*Dhal*).	....	In bags, 20 cwt.	....	....	In bags, 20 cwt.
Mustard seed	20 cwt.	16 cwt.	18 cwt.	20 cwt.	16 cwt.
Myrobalans.	Whole or crushed, 16 cwt.	In bags, 13 cwt.	17 cwt.	....	In bags, 13 cwt.
		Crushed in bags, 11 cwt.			
		(See note 2 on p. 340).			
		Powder, 15 cwt.			
Nigerseed .	20 cwt.	14 cwt.	17 cwt.	....	14 cwt.
Nutmegs .	In C/S 50 c. ft.	In cases, 40 c. ft.	In chests, 50 c. ft.	In casks, 50 c. ft.	In C/S, 40 c. ft.
Nux Vomica	Seed, 16 cwt.	In cases, 40 c. ft.	In bags or C/S, 16 cwt.	....	In cases, 40 c. ft.
		In bags, 13 cwt.	....	....	In bags, 13 cwt.
Oats . .	16 cwt.	....	12 cwt.	16 cwt.	....
Oil (See Coconut oil and Cottonseed oil separate.)	In C/S, 50 c. ft.	Of any kind in casks, 40 c. ft.	In C/S, 20 cwt.	In casks, 4 hhds.	Of any kind in cases, 40 c. ft.
	In casks or drums, 50 c. ft. Essential, *ad valorem.*	....	In casks, 210 Imperial galls.	In C/S, 50 c. ft.	....
Oilseed cake. (See Cotton seed cake separate).	20 cwt.	Oil cake powder, 16 cwt.	Poonac, 20 cwt.	Oilseed cake, 20 cwt.	Oilcake in cakes or lumps (in bags), 16 cwt.
		Oilcake, machine pressed, flat, except coconut, 17 cwt.			
		Oilcake, coconut (machine pressed, flat) of all shapes, 15 cwt.			
		Oilcake in pieces (machine pressed), 12 cwt.			
		Oilcake of all kinds (hand or bullock pressed), 12 cwt.			
Olibanum (See Gum)					
Onions (See Garlic)					

Name of the article.	CALCUTTA. Per ton nett.	BOMBAY. Per ton.	MADRAS. Per ton nett.	RANGOON. Per ton nett.	KARACHI. Per ton.
Opium	Per chest.	Per chest.	....	....	Per chest.
Ore of all description.	....	....	....	....	Loose or in bags, 20 cwt.
Orchids	....	....	....	40 c. ft.	....
Paddy	16 cwt.	In bags, 13 cwt.	In bags, 15 cwt.	20 cwt.	In bags, 13 cwt.
Palmyra fibre (See Coir and fibres of all sorts).					
Paraffin wax	....	....	....	In C/S, 20 cwt.	....
Peas	20 cwt.	....	20 cwt.	20 cwt.	White, 18 cwt.
Pepper	Long, 12 cwt.	In bags, 13 cwt.	In bags, 16 cwt.	....	In bags. 13 cwt.
	Black, 14 cwt.	....	....	....	....
Pig Iron and Pig Lead.	20 cwt.	....	....	....	....
Pimento	....	12 cwt.	....	....	12 cwt.
Planks and deals.	....	....	50 c. ft.	50 c. ft.	....
Plumbago	....	In bags, 16 cwt.	....	....	In bags 16 cwt.
Pollards	....	In bags, 10 cwt.	....	....	....
Poonac (See oil seed cakes also).	....	....	20 cwt.	....	....
Poppyseed	20 cwt.	In bags (1½ cwt.), 14 cwt. In double bags (1½ cwt.), 13 cwt. In single bags (1¼cwt.), 14 cwt. In double bags (1¼cwt.), 14 cwt	15 cwt.	....	In double bags (1½ cwts.), 13 cwt. In single bags (1¼ cwt.), 14 cwt. In double bags (1¼ cwt.), 14 cwt. In bags, (1½ cwt.) 14 cwt.
Private effects	....	....	....	40 c. ft.	....
Putchuck (costus root).	....	....	10 cwt.	....	....
Rags	....	....	....	50 c. ft.	....
Rails, Iron or steel (See Iron).					
Rapeseed	20 cwt.	16 cwt.	18 cwt.	20 cwt.	Rapeseed, Sita, Jamba and other kinds, 16 cwt.
Rattans (See Canes also)	For dunnage, 20 cwt. or 50 c. ft. (at Steamer's option).	In bundles, 13 cwt.	20 cwt.	For dunnage, 20 cwt.	In bundles, 13 cwt.
		Ground, 13 cwt.	....	....	Ground, 13 cwt.
Redwood (Dye).	For dunnage, 20 cwt. or 50 c. ft. (at Steamer's op-option.)	13 cwt.	For dunnage, 20 cwt.	....	13 cwt.

Name of the article.	CALCUTTA. Per ton nett.	BOMBAY. Per ton.	MADRAS. Per ton nett.	RANGOON. Per ton nett.	KARACHI. Per ton.
Rhea .	....	....	In bales, 50 c.ft.	....	....
Rhubarb .	....	In C/S, 40 c. ft.	....	....	In cases, 40 c. ft.
Rice . .	20 cwt.	In bags, 18 cwt.	In bags, 20 cwt.	In bags, 20 cwt.	In bags, 18 cwt.
Ricemeal or rice flour.	....	....	....	20 cwt.	....
Roping (See Coir, etc.).	Rope in coils or bundles, 50 c. ft.	....	In coils, 50 c. ft.	Rope in bundles, 16 cwt.	....
		....	Lines, twines in bundles, 14 cwt. Coirs in coils, 10 cwt.	Rope in coils, 50 c. ft.	....
Rum . .	....	....	In casks, 210 Imperial galls.	In casks, 2 puncheons.	....
Safflower .	20 cwt. or 50 c. ft.	In C/S, 40 c. ft.	In bales, 50 c. ft.	....	In C/S, 40 c.ft.
		In screwed bales, 40 c. ft.	....	....	In screwed bales, 40 c. ft.
		In bags, 8 cwt.	....	....	In bags, 8 cwt.
Safflower seed (Kardi).	....	Seed in bags, 13 cwt.	....	....	13 cwt.
Sago . .	....	In C/S, 40 c. ft.	In C/S, 50 c. ft.	In C/S. 50 c. ft.	In C/S, 40 c. ft.
Sal ammoniac	In bags or boxes, 20 cwt. gross.	In C/S, 40 c. ft.	In bags, 15 cwt.	....	In C/S, 40 c. ft.
		In bags, 15 cwt.	In C/S, 50 c. ft.	....	In bags, 15 cwt.
Salt . .	20 cwt.	28 Indian mds. of 82$\frac{2}{7}$ lbs.	20 cwt.	20 cwt.	28 Indian mds. of 82$\frac{2}{7}$ lbs.
Saltfish .	....	....	....	....	14 cwt.
Saltpetre .	20 cwt.	20 cwt.	20 cwt.	20 cwt.	20 cwt.
Sandalwood	....	9 cwt.	....	....	11 cwt.
		Roots and chips, 7 cwt.	....	....	....
Sapanwood. (Dye).	For dunnage, 20 cwt. or 50 c. ft. (at Steamer's option).	9 cwt.	20 cwt.	....	....
Sarsaparilla	....	....	50 c. ft.	....	....
Sealing wax	....	In C/S, 40 c. ft.	In C/S, 50 c. ft.	....	In C/S, 40 c. ft.
Senna .	In bales, 50 c. ft.	In bags, 5 cwt.	In bales, 50 c. ft.	....	In bags, 5 cwt.
		In bales, 40 c. ft.	....	....	In bales, 40 c. ft.
Sharks and fins.	....	....	16 cwt.	....	....
Shells .	....	Rough in bags, 16 cwt.	Rough in bags, 20 cwt.	Rough in bags, 20 cwt.	Rough in bags, 16 cwt.

Name of the article.	CALCUTTA.	BOMBAY.	MADRAS.	RANGOON.	KARACHI.
	Per ton nett.	Per ton.	Per ton nett.	Per ton nett.	Per ton.
Silk . .	Raw in bales, 50 c. ft. In cases or bales, 50 c. ft. Waste, 50 c. ft. Chasam, 50 c. ft. Piecegoods, 50 c. ft.	In bales, 8 cwt. In C/S, 40 c. ft.	Raw in bales, 10 cwt. Piecegoods, 50 c. ft.	Silk in C/S, 50 c. ft. Silk piecegoods, 50 c. ft. Silk (waste), 50 c. ft. Silk (raw) in bales, 50 c. ft.	In bales, 8 cwt. In C/S, 40 c. ft.
Silver, Specie and or valuable cargo.	*Ad valorem*	....	....	....	....
Sita oil seed (See Rape-seed).	....	....	....	....	....
Skins (See Hides).	In casks, 20 cwt. gross. In bales, 50 c. ft.	....	50 c. ft.	....	Tanned skins in pressed bales, 40 c. ft. Tanned skins in bundles, 8 cwt.
Soap . .	In bags, 15 cwt. In cases, 50 c. ft.	In C/S, 40 c. ft.	Country, in C/S, 50 c. ft. Country, in bags, 15 cwt. Country, in bars, 20 cwt.	Country, in C/S, 50 c. ft.	In C/S, 40 c. ft.
Sugar (See Jaggery).	20 cwt.	In double bags, 19 cwt.	Including Jaggery, in bags, 20 cwt.	In bags, 20 cwt.	In bags, 19 cwt.
Talc . .	In cases, 20 cwt. gross.	16 cwt.	20 cwt.	....	16 cwt.
Tallow .	In C/S or casks, 20 cwt. gross.	40 c. ft.	In C/S or casks, 20 cwt.	In casks, 20 cwt.	40 c. ft.
Tamarind .	In cases or casks, 20 cwt. gross.	15 cwt.	In cases or casks, 20 cwt.	In casks, 20 cwt.	15 cwt.
Tapioca .	....	....	50 c. ft.	....	....
Tea . .	50 c. ft. Waste, as broken stowage, 16 cwt.	In chests, 40 c. ft.	In chests, 50 c. ft.	In chests, 50 c. ft.	In chests, 40 c. ft.
Tilseed or Gingelly.	20 cwt.	15 cwt.	17 cwt.	20 cwt.	15 cwt.
Teak (See Timber).	....	Square planks and poon, 40 c. ft.	....	Teak in round or square logs, scantlings, 50 c. ft.	Teak square planks and poon, 40 c. ft.
Timber (See also Teak and Jack-wood separate.)	50 c.ft.	....	50 c. ft.	Padauk, 50 c. ft. Pyinkado, 50 c. ft.	

TONNAGE SCHEDULES FOR STEAMERS—*contd.*

Name of the article.	CALCUTTA.	BOMBAY.	MADRAS.	RANGOON.	KARACHI.
	Per ton nett.	Per ton.	Per ton nett.	Per ton nett.	Per ton.
Tobacco .	In bales or cases, 50 c. ft.	In bales, 40 c. ft.	In bales, 50 c. ft.	In bales, 50 c.ft.	In bales, 40 c.ft.
Tortoise shells (See shells).	....	In chests, 40 c.ft.	In chests, 50 c.ft.	....	In chests, 40 c.ft.
Turmeric .	16 cwt.	In bags, 11 cwt.	In bags, 14 cwt.	....	In bags, 11 cwt.
Tutenague .	....	16 cwt.	....	....	16 cwt.
Twine .	In cases, 50 c. ft.	....	....	....	....
Unrated wood.	....	11 cwt.	....	....	11 cwt.
Wax . .	20 cwt.	....	....	....	....
Weed seed .	....	In bags, 10 cwt.	....	....	....
Whanghees (*vide* canes.)	....	13 cwt.	....	....	13 cwt.
Wheat .	20 cwt.	18 cwt.	20 cwt.	20 cwt.	18 cwt.
Wines and spirits.	....	In casks and in C/S, 40 c. ft.	....	....	In casks and in cases, 40 c. ft.
Wolfram .	20 cwt.	....	....	....	....
Wool . .	50 c. ft.	In screwed bales, 40 c. ft.	In bales, 50 c.ft.	50 c. ft.	In screwed bales, 40 c. ft.
Zedoary .	....	16 cwt.	....	....	16 cwt.
All other articles not enumerated.	50 c. ft. or 20 cwt. gross, at steamer's option.	....	In bales or C/S, 50 c. ft.	....	....

NOTE 1. **Calcutta.**—(*a*) Measurement and, when necessary, weighment shall be made by the Bengal Chamber of Commerce, Licensed Measurers' Department in accordance with their rules, and their certificate shall be final, and freight shall be payable in accordance therewith.

(*b*) Goods in casks or cases to be calculated at gross weight when paying freight by weight.

(*c*) The term 'dead weight' shall be understood to mean the following articles only: sugar, saltpetre, rice, wheat, gram, dhall, and peas.

NOTE 2. **Bombay:—**

Tonnage Scale.—At a general meeting of the Bombay Chamber of Commerce held on 20th July 1883, the following resolution was passed :—' That the Tonnage Scale for steamers shall be on the basis of 40 cubic feet to the ton, but in no case to exceed 20 cwts. dead-weight.'

Bones, etc.—These standards are for guidance only. In case of disagreement either shipper or steamer may claim survey by the Chamber which may fix any scale as per standards intermediate or otherwise and that this alteration be given effect to in the supplements now being printed for publication with the report for the past year. A survey fee of Rs. 30 shall be paid on submission of the case.

Pressed bran.—Pressed bran to be understood as not less than 5 maunds (of 28 lbs.) in a bag of $45\frac{1}{2} \times 25$ inches.

Cottonseed.—The following Resolution was adopted at the annual general meeting on 6th March 1901 : That Cottonseed cleaned, be for the present omitted from the Chambers' tonnage scale and that this alteration be given effect to in the supplement now being printed for publication with the report for the past year.

Cylindrical packings.—On and after 1st April 1902 the following formula shall be recognized for the calculation of the cubical contents of cylindrical packings, *viz.*, the square of the diameter be multiplied into the length and one-fifth deducted from the product (Resolution, dated 12th March 1902).

Crushed myrobalans.—At the annual general meeting it was resolved that the footnote to the item crushed myrobalans in the Chamber's Tonnage Scale be amended to read as follows : (as in footnote to Bones).

NOTE 3. **Madras:** —*Rule.*—The articles mentioned in the margin are to be measured before shipment, at the press, or godown or on the beach at the option of the shipper and the measurement is to be entered on the face of the bill of lading. In measuring, the callipers are to take in the rope, or the iron hoop on the one side of the bale and leave it out on the other. Half inches are to be given and taken alternately. Ten bales per cent. as a maximum are to be measured, a moiety to be chosen by the shipper and a moiety by the ship : and in the event of any dispute arising, the bales are to be measured by a Surveyor to be appointed by the Chamber of Commerce. The Surveyor's decision to be final and his fee to be Rs. 5, one half to be borne by each party. All other goods to be measured at the port of discharge.

Coir in bales, Cotton, Ganja, Hemp, Jute, Munjeet, Palmyra fibre, Senna leaf, Wool, Sarsaparilla.

NOTE 4. **Karachi:**—

Tonnage Scale.—The Karachi Tonnage Scale for steamers shall be on the basis of 40 cubic feet to the ton, but in no case to exceed 20 cwts. dead-weight, except in the case of salt.

2. The standard ton at Karachi for measurement of goods shall be taken at 50 cubic feet for ships.
3. The freight on oil to be paid on the full-gauge of the cask ascertained at the port of discharge.
4. When freight is payable on weight, the same is to be on the net weight delivered.
5. When cotton is shipped at a rate per bale, in the absence of special agreement, if the average measurement exceeds 13 feet per bale, the ship shall be entitled to proportionate extra freight, but in no case shall be compelled to take bales larger than 14 feet.

Freight Inwards : Payable in Karachi.—The conversion into Indian currency of sterling freight inwards to Karachi payable in Karachi shall, unless otherwise stipulated, be made at the rate for Bank bills on London payable on demand ; and the rate ruling at the close of a mail shall be the rate applicable to such purpose during the subsequent week.

Freight Outwards : Payable in Karachi.—Difference of freight outwards from Karachi stated in sterling payable in Karachi (in absence of any stipulation to the contrary on either the shipping order or Charter Party) shall be converted into Indian Currency at the rate for Bank bills on London payable on demand. The rate applicable to such purpose shall be the rate ruling on the day on which the bill of lading is dated : an allowance of 4½ per cent. in the case of sailing ships and 2½ in the case of steamers, being made as discount to cover cost of insurance and interest, until the due date of the freight.

Shut-out Cargo.—The Harbour Board ruling in relation to shut out goods is as follows : That shut-out goods be in future charged half import and half export fees under the provisions of Rules 3 and 4 published under the Wharfage Fees Act III of 1879.

Bones, etc.—The scale for grades differing from the standards to be settled by private arrangement between shippers and steamer agents. Any disputes between them to be referred to and decided by the Committee of the Chamber.

Pressed bran.—Pressed bran to be understood as not less than 5 mds. (of 28 lbs.) in a bag of 45½ × 25 inches.

Cylindrical packages.—On and after 1st March 1903, the following formula shall be recognized for the calculation of the cubical contents of cylindrical packages, etc., *viz.*, that the square of the diameter be multiplied by the length and one-fifth be deducted from the product.

APPENDIX II.

Merchandise Marks Law.

Part I.—Principal provisions of the Indian Merchandise Marks Act, 1889, and connected acts relating to merchandise marks.

Prohibitions on importation.

Sea Customs Act, 1878, section 18.—No goods specified in the following clauses shall be brought, whether by land or sea, into British India :—

* * * * *

(*d*) Goods having applied thereto a counterfeit trade mark within the meaning of the Indian Penal Code, or a false trade description within the meaning of the Indian Merchandise Marks Act, 1889.

(*e*) Goods made or produced beyond the limits of the United Kingdom and British India, and having applied thereto any name or trade mark being, or purporting to be, the name or trade mark of any person who is a manufacturer, dealer or trader in the United Kingdom or in British India, unless—

(*i*) the name or trade mark is, as to every application thereof, accompanied by a definite indication of the goods having been made or produced in a place beyond the limits of the United Kingdom and British India, and

(*ii*) the country in which that place is situated is in that indication indicated in letters as large and conspicuous as any letter in the name or trade mark, and in the same language and character as the name or trade mark.

(*f*) Piecegoods, such as are ordinarily sold by length or by the piece, which—

(*i*) have not conspicuously stamped in English numerals on each piece the length thereof in standard yards, or in standard yards and a fraction of such yard, according to the real length of the piece, and

(*ii*) have been manufactured beyond the limits of India, or

(*iii*) having been manufactured within those limits, have been manufactured beyond the limits of British India in premises which, if they were in British India, would be a factory as defined in the Indian Factories Act, 1881.

Note.—For definition of piecegoods, see Part II.

Definitions.

Indian Merchandise Marks Act, 1889, section 2 (1).—Trade Mark has the meaning assigned to that expression in section 478 of the Indian Penal Code as amended by this Act.

Trade mark.

Indian Penal Code, section 478.—A mark used for denoting that goods are the manufacture or merchandise of a particular person is called a trade mark, and for the purposes of this Code the expression 'trade mark' includes any trade mark which is registered in the register of trade marks kept under the Patents, Designs and Trade Marks Act, 1883, and any trade mark which, either with or without registration, is protected by law in any British Possession or foreign State to which the provisions of the one hundred and third section of the Patents, Designs and Trade Marks Act, 1883, are, under Order in Council, for the time being applicable.

Counterfeit.

Indian Penal Code, section 28.—A person is said to 'counterfeit' who causes one thing to resemble another thing intending by means of that resemblance to practise deception, or knowing it to be likely that deception will thereby be practised.

Explanation 1.—It is not essential to counterfeiting that the imitation should be exact.

Explanation 2.—When a person causes one thing to resemble another, and the resemblance is such that a person might be deceived thereby, it shall be presumed until the contrary is proved, that the person so causing the one thing to resemble the other thing intended by means of that resemblance to practise deception or knew it to be likely that deception would thereby be practised.

Indian Merchandise Marks Act, 1889, section 2 (2).—' Trade description ' means any description, statement or other indication, direct or indirect,—

Trade description.

(*a*) as to the number, quantity, measure, gauge or weight of any goods, or
(*b*) as to the place or country in which, or the time at which, any goods were made or produced, or
(*c*) as to the mode of manufacturing or producing any goods, or
(*d*) as to the material of which any goods are composed, or
(*e*) as to any goods being the subject of any existing patent, privilege, or copyright;

and the use of any numeral, word or mark which according to the custom of the trade is commonly taken to be an indication of any of the above matters shall be deemed to be a trade description within the meaning of this Act.

(3) ' False trade description ' means a trade description which is untrue in a material respect as regards the goods to which it is applied, and includes every alteration of a trade description, whether by way of addition, effacement or otherwise, where that alteration makes the description untrue in a material respect, and the fact that a trade description is a trade mark or part of a trade mark shall not prevent such trade description being a false trade description within the meaning of this Act.

False trade description.

Indian Merchandise Marks Act, 1889, section 4 (1).—The provisions of this Act respecting the application of a false trade description to goods or respecting goods to which a false trade description is applied, shall extend to the application to goods of any such numerals, words or marks, or arrangement or combination thereof, whether including a trade mark or not, as are or is reasonably calculated to lead persons to believe that the goods are the manufacture or merchandise of some person other than they really are and to goods having such numerals, words or marks, or arrangement or combination, applied thereto.

Provisions supplemental to the definition of false trade description.

(2) The provisions of this Act respecting the application of a false trade description to goods, or respecting goods to which a false trade description is applied, shall extend to the application to goods of any false name or initials of a person, and to goods with the false name or initials of a person applied in like manner as if such name or initials were a trade description, and for the purpose of this enactment the expression false name or initials means, as applied to any goods, any name or initials—

(*a*) not being a trade mark, or part of a trade mark, and
(*b*) being identical with, or a colourable imitation of, the name or initials of a person carrying on business in connection with goods of the same description and not having authorised the use of such name or initials.

(3) A trade description which denotes or implies that there are contained in any goods to which it is applied more yards, feet or inches than there are contained therein standard yards, standard feet or standard inches is a false trade description.

Sea Customs Act, 1878, section 19-A (3).—Where there is on any goods a name which is identical with, or a colourable imitation of, the name of a place in the United Kingdom or British India, that name, unless accompanied in equally large and conspicuous letters and in the same language and character, by the name of the country in which such place is situate, shall be treated for the purposes of section 18 . . as if it were the name of a place in the United Kingdom or British India.

Identical names of places.

Section the Ind Mercha: Marks

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Indian Merchandise Marks Act, 1889, section 5 (2).—A trade description shall be deemed to be applied whether it is woven, impressed or otherwise worked into or annexed or affixed to the goods or any covering label, reel or other thing.

Application of trade description.

(3) The expression 'covering' includes any stopper, cask, bottle, vessel, box, cover, capsule, case, frame or wrapper, and the expression 'label' includes any band or ticket.

Covering.

Indian Merchandise Marks Act, 1889, section 2 (4).—'Goods' means anything which is the subject of trade or manufacture.

Goods.

Name.

(5) 'Name' includes any abbreviation of a name.

General Clauses Act, 1897, section 3 (39).—'Person' shall include any company or association or body of individuals, whether incorporated or not.

Person.

Indian Merchandise Marks Act, 1889, section 21.—In the case of goods brought into British India by sea, evidence of the port of shipment shall, in a prosecution for an offence against this Act or section 18 of the Sea Customs Act, 1878, as amended by this Act, be *primâ facie* evidence of the place or country in which the goods were made or produced.

Evidence of origin.

Indian Merchandise Marks Act, 1889, section 21.—An officer of the Government whose duty it is to take part in the enforcement of this Act shall not be compelled in any Court to say whence he got any information as to the commission of any offence against this Act.

Information as to commission of offences.

Sea Customs Act, 1878, section 19-A.—Clauses (2), (4), (5), (6) enable the Governor General in Council to make regulations respecting the conditions, if any, to be fulfilled before such detention and confiscation, to determine the information, notices and security to be given, the evidence requisite for any of the purposes of the section and the mode of verification of such evidence, as well as the reimbursement of public officers and the State by an informant for expenses and damages incurred in respect of any detention made on his information, and of any proceedings resulting therefrom. Section 19A (1) authorises the Customs authorities to require regulations so issued to be complied with before taking proceedings.

Rules and regulations.

Indian Merchandise Marks Act, 1889, section 16 (1).—The Governor General in Council may, by notification in the *Gazettee of India* and in local official Gazettes, issue instructions for observance by Criminal Courts in giving effect to any of the provisions of this Act.

(2) Instructions under sub-section (1) may provide, among other matters, for the limits of variation, as regards number, quantity, measure, gauge or weight, which are to be recognized by Criminal Courts as permissible in the case of any goods.

Note.—Such instructions are also a guide to Customs officers.

Indian Merchandise Marks Act, 1889, section 19.—For the purposes of section 12 of this Act and clause (*f*) of section 18 of the Sea Customs Act, 1878, as amended by this Act, the Governor General in Council may, by notification in the *Gazette of India*, declare what classes of goods are included in the expression 'piecegoods' such as are ordinarily sold by length or by the piece.

Indian Merchandise Marks Act, 1889, section 20.—This section enables the Governor General in Council to make rules regulating with respect to any goods the first selection and testing of samples, the value of the evidence so obtained, the conditions under which a further selection and testing may be made, and the value of the further evidence so obtained.

For goods not covered by such rules the section enables Customs officers to issue orders having a similar effect, namely :—

(2) The . . . officer of Customs . . . having occasion to ascertain the number, quantity, measure, gauge or weight of the goods, shall, by order in

writing, determine the number of samples to be selected and tested and the manner in which the samples are to be selected.

(3) The average of the results of the testing in pursuance of . . . . an order, under sub-section (2) shall be *primâ facie* evidence of the number, quantity, measure, gauge or weight, as the case may be, of the goods.

(4) If a person having any claim to, or in relation to, any goods of which samples have been selected and tested in pursuance of . . . . an order under sub-section (2) desires that any further samples of the goods be selected and tested, they shall, on his written application and on the payment in advance by him to the . . . . officer of Customs . . . . . of such sums for defraying the cost of the further selection and testing as the . . . . officer may from time to time require, be selected and tested to such an extent as . . . . the officer of Customs may determine in the circumstances to be reasonable, the samples being selected in manner prescribed under . . . sub-section (2) . . . . . .

(5) The average of the results of the testing referred to in sub-section (3) and of the further testing under sub-section (4) shall be conclusive proof of the number, quantity, gauge or weight, as the case may be, of the goods.

Part II.—Notifications under the Indian Merchandise Marks Act, 1889, and connected acts.

No. 1430, dated the 6th April 1891, as subsequently amended.—In exercise of the powers conferred by section 19-A, sub-section (2), of the Sea Customs Act, 1878 (as amended by section 11 of the Indian Merchandise Marks Act, 1889), and sections 19 and 20 of the Indian Merchandise Marks Act, 1889 (as amended by Act IX of 1891), the Governor General in Council is pleased to make the subjoined rules and orders :—

Stamping of piecegoods.

1. Piecegoods, such as are ordinarily sold by length or by the piece, shall be deemed to include woollen goods of all kinds and the undermentioned descriptions of cotton goods, namely :—

Book-binding cloth.
Brocades.
Cambrics.
Canvas.
Crimps.
Checks, spots and stripes.
Chudders.
Coatings, including tweeds, cashmeres and serges.
Crape.
Denims.
Dhootis, single or in pairs.
Domestics.
Dorias.
Drills.
Flannel and flannelettes.
Gauze.
Grenadines.
Harvards.
Italian cloth.
Jaconets.
Jeans.
Lappets.
Lawns, including allovers.
Lenos.
Longcloth.
Madapollams.
Meltons, dyed and printed.
Mulls.
Muslins.
Nainsooks.
Net.
Oxfords.
Printers.
Prints.
Saris, single or in pairs.
Scarves, including cotton shawls and dupetas.
Sheetings.
Shirtings, including dyed shirtings.
Silecia.
Spanish stripes.
Tanjibs.
Ticks.
Trouserings.
Tussores.
Twills.
T-cloth and Mexicans.
Umbrella cloth.
Velvets and velveteen.
Venetian cloth.
Vestings, including mattings and piques.
Waist coatings.
Zephyr cloth.

2. Other classes of piecegoods shall not be detained if unstamped; and unstamped cotton and woollen piecegoods imported for the personal use of individuals or private associations of individuals and not for trade purposes shall not be detained.

3. Examinations of packages to ascertain whether the goods mentioned in Rule 1 are stamped shall be made at frequent intervals at the discretion of the Customs Collector and either under his personal instructions or under general orders, and instructions given by him to an Assistant Collector.

4. The piecegoods contained in the packages so examined need not be examined, when found to be stamped, to test the accuracy of the stamping, except on information received, or when the Customs Collector has reason to suspect that the stamping is false.

5. All measurements of piecegoods shall be made on the table.

Testing of yarns.

6. Yarns need not be examined or measured, except on information received, or when the Collector has reason to suspect that the trade description is false.

7. An examination of yarns to test the accuracy of the description of count or length shall be made, in the first instance, up to the limit of one bundle in every one hundred bales or fraction of one hundred bales in the consignment.

8. If, on such examination, the difference between the average count or length and the described count or length is in excess of the variations permitted in paragraphs III and IV of the Notification of the Government of India in the Home Department, No. 1474 (Judicial), dated the 13th November 1891, the importer may require a further examination to be made up to the limit and on the condition stated in Rule 9.

9. The test to determine length of yarns shall be applied as follows :—

From every one hundred bales, or fraction of 100 bales, in a consignment one bundle should be selected at random. The hanks in this bundle should then be measured on the wrap-reel, one after the other, in the presence of a representative of the importer, and the lengths noted, the process being continued (within the limits of the bundle) until either the importer is satisfied that the yarn is short, or the average of the lengths noted shows that it is of full length.

When the importer is dissatisfied with this test, he may, on payment of the cost, require the Customs Collector to measure more hanks up to 1 per cent. of the total number of hanks in the consignment, such hank being taken at random by an officer of Customs out of any bundles in the consignment.

10. The Customs Collector may require from any informant a security not exceeding five hundred rupees. If the Collector should be satisfied that the information given is wilfully false, the security shall be forfeited.

Trade descriptions of length and width.

2. *No. 1474, dated the 13th November 1891, as subsequently amended.*—In exercise of the powers conferred by section 16 of the Indian Merchandise Marks Act, IV of 1889, and in supersession of all existing orders on the subject, the Governor General in Council directs that Criminal Courts, in giving effect to the provisions of the Act in respect of trade descriptions of quantity, measure, or weight of the goods specified hereunder, shall observe the following instructions :—

I.—A trade description of length stamped on *grey, white,* or *coloured cotton piece-goods* shall not be deemed to be false in a material respect, unless—

(*a*) where a single length is stamped, the description exceeds the actual length by more than—

4 inches in pieces stamped as 10 yards long and under ;
5 inches in pieces stamped as above 10 yards and up to 23 yards long ;
7 inches in pieces stamped as above 23 yards and up to 36 yards long ;
9 inches in pieces stamped as above 36 yards and up to 47 yards long ;
18 inches in pieces stamped as above 47 yards long :

Provided that the average length of the goods in question shall not be less than the stamped length;

(*b*) where a maximum and a minimum length are stamped, the described maximum length is greater than the actual length by more than—

9 inches in piecegoods under 35 yards long;
18 inches in piecegoods 35 yards and up to 47 yards long;
36 inches in piecegoods above 47 yards long;

Provided that no such piece shall measure less than the minimum stamped length.

II.—A trade description of width stamped on *grey, white,* or *coloured cotton piecegoods* shall not be deemed to be false in a material respect, unless the description exceeds the actual width by—

half an inch in pieces stamped as 40 inches or less in width;
three-quarters of an inch in pieces stamped as over 40 inches or under 59 inches in width;
one inch in pieces stamped as 59 inches or more in width:

Provided that the average width of the goods in question shall not be less than the stamped width.

Trade descriptions of count.

III.—A trade description of count or number, length or weight, applied to *grey* or *bleached cotton yarn,* shall not be deemed to be false in a material respect, unless—

(*a*) the described count or number is greater or less than the actual count or number by more than 5 per cent., provided that the average count of the whole of the yarn in question is not greater or less than the described count; or

(*b*) the average length of the whole number of hanks in a bundle is less than 840 yards; or

(*c*) in a bundle of yarn of any count under 50, described as being ten pounds in weight, the number of knots of twenty hanks each is not half, or the number of knots of ten hanks each is not the same as, and the number of knots of five hanks is not double, the described count or number of the yarn; or

(*d*) in a bundle of yarn of any count under 50, described as being 5 lbs. in weight, the number of knots of 20 hanks each is not a quarter of, or the number of knots of 10 hanks each is not half, or the number of knots of 5 hanks each is not the same, as, the described count or number of the yarn; or

(*e*) in a bundle of yarn of any count from 50 upwards, the number of knots of twenty hanks each is not half, or the number of knots of 40 hanks each is not a quarter when the described weight is ten pounds, and is not a quarter or an eighth, when the described weight is five pounds, of the count or number of the yarn; or

(*f*) in the case of *bleached yarn,* the described weight exceeds the actual weight by more than—

7½ per cent. in counts from 1 to 8;
5 per cent. in counts from above 8 to 18;
4 per cent. in counts from above 18 to 30;
2½ per cent. in counts from above 30 to 80.

IV.—A trade description of count or number applied to a bundle of *dyed cotton yarn* shall be accepted as indicating length only, the hank being taken to measure 840 yards, and it shall be deemed to be false in a material respect if the average length of the hanks in a bundle is less than 819 yards.

V.—A trade description of length applied to *thread of any kind* (of cotton, wool, flax or silk) shall not be deemed to be false in a material respect, unless it exceeds the actual length by more than 1 per cent.

VI.—The dimensions of goods on which their length or width is stamped shall be determined by measurement in imperial yards of thirty-six inches.

APPENDIX III.

THE PRINCIPAL RAILWAYS IN INDIA AND THE AREA AND TRADE CENTRES SERVED BY THEM.

Railways and Headquarters.	Mileage open or in the course of construction on 31st March 1918.	Gauge.†	Area served with principal internal trade centres.
Bengal Nagpur Railway. (Calcutta.)	3,123	A (2,169 miles). C (903 miles). D (51 miles)	Eastern half of the Central Provinces, Bihar and Orissa and up to Vizagapatam in Madras Presidency. Raipur, Nagpur, Jubbulpore, Amraoti.
Bombay, Baroda and Central India Railway. (Bombay.)	4,076	A (1,219 miles). B (2,399 miles). C (458 miles).	Northern half of the Bombay Presidency, Central India and the southern portion of Rajputana. Surat, Broach, Ahmedabad, Muttra, Delhi.
*Eastern Bengal State Railway. (Calcutta.)	1,744	A (622 miles). B (1,067 miles). C (55 miles).	Eastern Bengal, the North-Western portion of Assam and the northern Gangetic plain in Bengal to the foot of the Himalayas. Naihati, Murshidabad, Patna Goalundo, Naraingunj, etc.
East Indian Railway (Calcutta.)	2,783	A.	Southern end of the Punjab, United Provinces, Bihar and Western Bengal. Mirzapur, Benares, Allahabad, Katni, Cawnpore, Agra, Aligarh, Delhi, etc., etc.
Great Indian Peninsula Railway. (Bombay.)	3,441	A (3,227 miles). C (201 miles). D (13 miles).	Central portion of Bombay Presidency, Hyderabad, western half of Central Provinces, Central India, lower part of the United Provinces and some part of Rajputana. Poona, Raichur, Ahmednagar, Nasik, Sholapur, Akola, Amraoti, Nagpur, Jubbulporo, Katni, Gwalior Agra, etc., etc.

* Indicate State Railway.
† A Standard gauge 5′ 6″. B Metre gauge 3′ 3⅜″. C Narrow gauge 2′ 6″. D Narrow gauge 2′ 0″.

THE PRINCIPAL RAILWAYS IN INDIA AND THE AREA AND TRADE CENTRES SERVED BY THEM—*contd.*

Railways and Headquarters.	Mileage open or in the course of construction on 31st March 1918.	Gauge.†	Area served with principal internal trade centres.
Madras and Southern Mahratta Railway. (Madras.)	3,171	A (1,063 miles). B (2,108 miles).	Northern and central parts of the Madras Presidency, a small part of Hyderabad, and the southern part of Bombay Presidency and Mysore. Bangalore, Mysore, Guntakal, Poona, Guntur, Bezwada, Ellore, Cocanada.
Nizam's Guaranteed State Railway. (Secunderabad.)	910	A (352 miles) . B (558 miles) .	Hyderabad State. Bezwada, Singareni, Hyderabad.
*North Western Railway. (Lahore.)	5,302	A (4,852 miles). C (240 miles) D (210 miles)	Sind, the Punjab, North-West Frontier Province, Baluchistan. Hyderabad (Sind), Larkana, Shikarpur, Jacobabad, Quetta, Rawalpindi, Lahore, Amritsar, Lyallpur, etc.
*Oudh and Rohilkhand Railway. (Lucknow.)	1,624	A (1,542 miles). B (82 miles) .	Central and eastern parts of the United Provinces. Benares, Lucknow, Fyzabad, Aligarh, Meerut, Saharanpur, Dehra Dun.
South Indian Railway. (Trichinopoly.)	1,953	A (450 miles) . B (1,405 miles). C (98 miles).	Whole of Southern India, south of the south-west line of Madras and Southern Mahratta Railway connecting *viâ* Dhanuskodi and Talaimanaar with Ceylon. Trichinopoly, Madura, Salem, Coimbatore, Calicut and Tuticorin.
Assam Bengal Railway. (Chittagong.)	1,045	B . .	The Province of Assam. Naraingunj, Sylhet, Silchar, Gauhati, etc.
Bengal and North Western Railway. (Gorakhpur U. P.)	2,046	B . .	Northern portions of the United Provinces, and of Bihar. Monghyr, Gorakhpur, Allahabad, etc.
Burma Railways . (Rangoon.)	1,633	B .	Upper and Lower Burma. Pegu, Myingyan, Mandalay, Bassein, Martaban (for Moulmein), etc.

* Indicate State Railway.
† A Standard gauge 5′ 6″. B Metre gauge 3′ 3⅜″. C Narrow gauge 2′ 6″. D Narrow gauge 2′ 0″.

APPENDIX IV.

Regulations governing the admission into British India of samples and patterns brought by Commercial Travellers from the United Kingdom.

I.—Importation.

(1) On the production by a commercial traveller of a list or declaration containing a full description of every sample brought by him, officially attested by the Customs authorities in the United Kingdom, examination of the samples may be limited to ascertaining that they are fully enumerated on the list produced.

(2) The list referred to in the preceding sub-paragraph is to be utilized in assessing the duty chargeable on the samples. A deposit of the duty is required before delivery of the samples, or alternatively a bond (with sufficient security) for the amount thereof may be accepted instead of a cash deposit.

(3) If the commercial traveller is unprovided with the list referred to in sub-paragraph 1, he may be required to produce to the Collector of Customs a certificate or letter of identity from his principals or otherwise satisfy the Collector of his eligibility for the concession. If the Collector is satisfied on this point, a list will be compiled by the commercial traveller, giving a full description of every sample sufficient for identification and assessment of the duty chargeable thereon. The duty will be deposited or security given as set out in the preceding sub-paragraph.

(4) Should the samples bear the marks, stamps or seals of the country of exportation, no additional marks or seals for purposes of identification need, as a rule, be affixed by officers of the Customs Department. Contrariwise, if the samples on importation bear no seals they are to be marked or sealed for future identification, should such a course be deemed necessary, by the Customs officers at the port of arrival.

(5) The list of the samples, whether that produced by the commercial traveller or that compiled at the port of arrival, will be signed and dated by the officer at the port or place of importation, who will affix to the list a statement bearing the official seal or stamp, and showing—

(*a*) the name of the port at which the samples are imported, and the amount of duty chargeable on the patterns or samples; also whether it was deposited in money or whether security was given.

(*b*) the marks, if any, that have been applied to the patterns or samples.

(*c*) the date upon which the amount of duty deposited will be carried to the public account or the amount recovered under the security given, unless it is proved that the patterns or samples have been previously re-exported or placed in bond. This date is to be not later than twelve months from that upon which the samples were brought into the country.

No charge is to be made for the document issued or certified by the Customs officers or for marking for identification.

(6) The production of the list referred to in sub-paragraph 1 will not be required in the case of patterns or samples not liable to duty, and the examination of packages containing such patterns or samples will be restricted to ascertaining that no dutiable articles are contained therein, and that the goods produced are *bonâ fide* samples.

All samples of no commercial value are entitled to free entry.

11.—Exportation.

(7) Patterns and samples of dutiable articles may be produced to the Customs officers at any port in British India for examination prior to exportation.

(Non-dutiable samples are not required to be produced on shipment.)

(8) To obtain the return of the deposit made on entry of the patterns or samples, or the cancellation of the bond entered into, the commercial traveller is required to produce with his samples the list thereof, signed by the officers at the port of arrival. Provided that the time allowed for production (see sub-paragraph 5 (*c*)) has not been exceeded, and the Customs officers are satisfied that the goods as produced are identical with those enumerated on the list, the amount of duty originally deposited will be refunded. The list is to be noted as to the exportation of the samples, the statement referred to in sub-paragraph 5 being retained.

(9) The statement is to be transmitted, with a certificate of exportation of the samples, to the Collector at the port of importation, with the object of having an adjustment of accounts effected, where a deposit has been made, or the bond cancelled, as the case may be.

APPENDIX V.

GOVERNMENT CROP FORECASTS.

The following statement shews the dates on which provincial forecasts of crops are transmitted by Local Governments and the dates on which general memoranda are issued by the Director of Statistics.

Provinces and articles concerned.	Issue by Local Government.	Issue of consolidated forecast by Director of Statistics.
Rice.		
1st report—		
Bengal, Bihar and Orissa and Assam. Summer,	April	October 20 (1st memorandum)
Bengal, Bihar and Orissa and Assam. Autumn, Winter	September 30	
Bombay	October 1	
Central Provinces and Berar	„ 3	
Burma, Madras and United Provinces	„ 15	
2nd report—		
Burma (2nd report)	November 15	December 20 (2nd memorandum)
Bombay	December 1	
Bengal, Bihar and Orissa and Assam (Autumn and Winter).	„ 15	
Burma (3rd report)	„ 15	
Madras and United Provinces	„ 15	
Central Provinces and Berar (final)	„ 15	
3rd report—		
Burma (4th report)	January 15	February 20 (Final memorandum)
Bengal, Bihar and Orissa and Assam (Winter).	February 15	
Bombay (Spring).	„ 15	
Burma (5th report)	„ 15	
Madras, United Provinces and Coorg	„ 15	
Wheat.		
1st report—		
Punjab, United Provinces, Central Provinces and Berar, Bombay, North-West Frontier Province, Bengal, Bihar and Orissa, Ajmer-Merwara, Delhi, Mysore, Hyderabad, Central India, Rajputana.	January 20	January 31 (1st memorandum)
2nd report—		
All provinces mentioned above	March 1	March 15 (2nd memorandum)
3rd report—		
North-West Frontier Province	May 22	May 30 (3rd memorandum)
All other provinces mentioned above	„ 15	

Provinces and articles concerned.	Issue by Local Government.	Issue of consolidated forecast by Director of Statistics.
4th report—		
All provinces mentioned above . .	August 1	August 10 (Final memorandum).
Cotton.		
1st report—		
Punjab, United Provinces, Central Provinces and Berar, Madras, Burma, North-West Frontier Province, Assam, Bengal, Bihar and Orissa, Ajmer-Merwara, Hyderabad, Rajputana, Central India, Mysore, and Bombay (early).	August 10	August 15 (1st memorandum)
2nd report—		
All provinces mentioned above . .	October 10	October 15 (2nd memorandum).
3rd report—		
All provinces mentioned above . .	December 10	December 15 (3rd memorandum)
4th report—		
All provinces mentioned above . .	February 10	February 15 (Final memorandum).
Linseed, rape and mustard (Winter oil-seeds).		
1st report—		
Punjab, Bengal, Bihar and Orissa . .	December 20	January 1 (1st memorandum).
United Provinces and Bombay (rape and linseed).	" 20	
Central Provinces and Berar (linseed) .	" 20	
Assam (rape and mustard)	" 20	
North-West Frontier Province (rapeseed)	" 20	
Hyderabad (all oilseeds)	" 20	
Madras (castor)	January .	
2nd report—		
Punjab, Bengal, Bihar and Orissa .	March 1	March 15 (2nd memorandum).
United Provinces and Bombay (rape and linseed).	" 1	
Central Provinces and Berar (linseed) .	" 1	
Assam (rape and mustard seed) . .	" 1	
North West Frontier Province (rapeseed)	" 1	
Hyderabad (all oilseeds)	" 1	
3rd report—		
Punjab, Bengal, Bihar and Orissa . .	May 15	June 11 (Final memorandum)
United Provinces and Bombay (rape and linseed).	" 15	
Central Provinces and Berar (linseed) .	" 15	
North-West Frontier Province (rapeseed)	" 22	

Provinces and articles concerned.	Issue by Local Government.	Issue of consolidated forecast by Director of Statistics.
Sesame (*til or gingelly*).		
1st report—		
Bengal (early crop)	July 31	September 1 (1st memorandum)
Bihar and Orissa (early crop)	August 15	
Bombay, Madras, Central Provinces and Berar, United Provinces, Ajmer-Merwara, Punjab.	" 15	
2nd report—		
Bihar and Orissa (late crop-1st report)	October 15	October 20 (2nd memorandum)
All other provinces mentioned above except Bengal.	" 15	
3rd report—		
Bengal (late crop)	December 31	January 15 (Final memorandum)
Bihar and Orissa (late crop-2nd report)	January 1	
Madras	" 12	
All other provinces mentioned above	" 1	
4th report—		
Madras	April 15	April 20 (Supplementary memorandum)
Groundnut.		
1st report—		
Burma	August 10	October 20 (1st memorandum)
Bombay	" 15	
2nd report—		
Burma	October 10	
Bombay	" 15	
Madras (1st report)	" 15	
3rd report—		
Burma	December 10	February 15 (Final memorandum)
Bombay	January 15	
Madras (2nd report)	February 10	
Burma (4th report)	" 10	
Indigo.		
1st report—		
Madras	September 15	October 15 (1st memorandum)
Bengal, Bihar and Orissa	" 30	
United Provinces and Bombay	October 1	
Punjab	" 15	
2nd report—		
Bombay	December 1	December 20 (Final memorandum)
Madras, Bengal, Bihar and Orissa and United Provinces.	" 15	
Punjab	" 20	

Provinces and articles concerned.	Issue by Local Government.	Issue of consolidate forecast by Director (Statistics.
Sugarcane.		
1st report—		
Bengal, Bihar and Orissa, Assam, Madras, United Provinces, Punjab, North-West Frontier Province, Bombay, Central Provinces and Assam.	August 15	August 20 (1st memorandum)
2nd report—		
All provinces mentioned above . .	October 15	October 20 (2nd memorandum)
3rd report—		
United Provinces and North-West Frontier Province.	February 16	February 16 (Final memorandum
All other provinces mentioned above .	January 31	
Jute.		
1st report—		
Bengal, Assam, Bihar and Orissa . .	July 7—15	*
2nd report—		
Bengal, Assam, Bihar and Orissa . .	September 21	

* Issued by the Director of Agriculture, Bengal.

APPENDIX VI.

GLOSSARY OF INDIAN TERMS USED IN THIS BOOK.

A

Abkari	Excise of liquors and drugs.
Ajwan	An essential oilseed obtained from *carum copticum.*
Ajwan-ka-phul	Thymol (*lit.* flowers of ajwan).
Arhar	The pigeon pea, (*cajanus indicus*).
Arathdar	From *arath* a warehouse—a middleman.
Atta	Coarse wheat flour used by the poorer classes, intermediate in quality between *maida* and *sujji* (q.v.)
Attar	The fragrant essential oil of roses, jasmine and other flowers.
Avaram	The Tamil name for the bark of *cassia auriculata* extensively used in Southern and Western India for tanning hides and skins. Called *tarwad* or *tarwar* in Bombay Presidency.

B

Babul	A thorny tree (*Acacia arabica*) which in Sind is a common host of the lac insect. The bark is used for tanning.
Bajra	The bulrush millet (*pennisetum typhoideum*), known as *cambu* in South India.
Ballam	A particular quality of boiled rice, long-grained.
Bania	A petty shop-keeper or money-lender.
Bhang	The dried leaves and flowering shoots of *cannabis sativa*, which ground to a paste and taken as an emulsion are a powerful narcotic.
Beer (ber)	A thorny shrub (*zizyphus jujuba*), which in the Punjab is a common host of the lac insect.
Bepari	A small trader, who acts as a middleman in the marketing of grain, hides, etc.
Biri (bidi)	Country made cigarette.
Bispath	An inferior quality of tobacco obtained in Bengal.
Borah	A bamboo basket in which wool is transported.
Bysaki	One of the four lac crops called after the Bengali month 'Bysak' corresponding to April-May, when it comes commercially into sight.

C

Catamaran	A floating raft made of logs tied together.
Chabyam	A quality of unpolished rice obtainable in Southern India.

Chadar	A shawl, of cotton, wool or silk.
Chapati (Chaupatti). .	An unleavened cake made generally of *atta* or coarse wheat flour.
Charas	A narcotic derived from the resin of *cannabis sativa,* used for smoking.
Chasam	Silk waste.
Chauki . . .	An outpost for the collection of revenue.
Chekku	A Malayalam word, meaning 'a small mill,' corrupted into chuck-mill.
Chetty	A caste in South India, moneylenders, or merchants by profession.
Cooly	An Indian labourer.
Cholam	The Tamil name for the large millet (*sorghum vulgare*) known as *jawar* in Northern India.
Copra	The dried meat of the coconut.
Corge	A score.
Crore	Ten million, generally applied to the currency. A crore of rupees.

D

Dahi (Dayi) . . .	Curdled boiled milk.
Dari	A pileless cotton carpet.
Deodar . . .	The Himalayan cedar (*cedrus libani v. deodara*).
Deshi (daisee) . .	An Urdu word meaning 'indigenous' applied as a trade name to varieties of jute and other produce.
Dhal	A generic term applied to various pulses.
Dhak	A common host of the lac insect (*butea frondosa*) also known as *palas.*
Dholl	A bundle or package.
Dhooti	Piece of cloth in varying lengths with coloured borders, worn by men.
Dhow	A small country boat.
Dowd Khani . . .	A variety of boiled brown Bengal rice.

E

Eng (Ing) . . .	A deciduous forest tree (*dipterocarpus tuberculatus*) yielding valuable timber, grown chiefly in Burma.
Eri	A variety of silk-worm (Assam).

G

Ganja	A narcotic derived from the unfertilised flowers of the female plants of *cannabis sativa.*
Ghi (ghee) . . .	Clarified butter.
Godown . . .	A ware house.
Gur	Crude molasses.

H

Hundi (hoondee) . .	An Indian bill of exchange.

J

Jainama (ja-namaz)	A pileless cotton prayer mat.
Jamkalam	A pileless cotton carpet made in Southern India.
Jawar	See *cholam*.
Jethwa	The lac crop which comes on the market in June-July, called after the corresponding Bengali month 'Jaistha.'

K

Kala-til	Niger seed, lit. 'black til' from its resemblance to sesame or til.
Kapok (Malay)	The floss of the white silk cotton tree (*eriodendron anfractuosum*).
Katki	A lac crop that comes commercially into sight in November, called after the corresponding Bengali month 'Kartik.'
Kazla (Kajla)	The commonest variety of boiled rice obtainable in Bengal.
Khair	Cutch, obtained from the heart-wood of *acacia catechu.*
Khari	Glauber's salt or sodium sulphate.
Kharif	The crop sown just before or during the South-West monsoon.
Khood (coodie)	Broken rice.
Kiri	Residue left over in the manufacture of shellac, containing about 50 per cent of lac.
Kurpah (Cuddapah)	A quality of Madras indigo sold in Calcutta.
Kushmi	One of the four lac crops marketed in November-December.
Kusum (oil)	Carthamus oil, obtained from *carthamus tinctoria.*
Kusumb.	A forest tree (*schleichera trijuga*) the host of the lac insect from which the best lac is derived.
Kutcha (Kacha)	An Urdu word meaning inferior or bad.
Kuthia	Inferior quality of saltpetre of from 20 to 40 per cent refraction.

L

Lakh	One hundred thousand.
Let-pet	Pickled tea, eaten as a condiment in Burma and the Shan States.
Lungi (Loongi)	A tubular piece of cloth of silk or cotton worn as a waist cloth.

M

Masula	A small boat (South India).
Maddar	Applied to two different varieties of plants whose roots yield a red dye.
Mahajan	A money-lender or big merchant who advances money to the cultivator against his crops.
Mahua (mowra)	A forest tree (*bassia latifolia*) whose dried flowers are eaten as food or distilled into liquor.

Maida	Wheat flour superior to *atta* obtained by regrinding *sujji* or coarse flour and passing it through fine sieves.
Masur	The lentil (*lens esculenta*).
Maund (man) . . .	A weight varying in different localities (see under Weights and Measures, p. 322).
Mohur	A gold coin (see coinage, p. 322).
Monsoon . . .	Periodical rain bearing winds. Applied to the two rainy seasons in India: the South-West monsoon from June to September and the North-East from October to December.
Muga	A variety of silk-worm (Assam).
Mung	A common variety of pulse (*phaseolus radiatus*).

N

Neyi	The South-Indian term for *ghi*.
Nuniya (Noonia) . .	The producer of crude, unrefined saltpetre.

O

Omam (water) . .	Liquor obtained by distillation from *carum copticum.*

P

Padauk	A valuable timber tree (*pterocarpus macrocarpus*) grown in Burma.
Paka (oil) . . .	Oil obtained from the seeds of *schleichera trijuga.*
Palas	See *dhak.*
Pan supari . . .	The universal masticatory composed of *pan* (leaf of betel vine), and *supari* (fruit of the betel palm), with an admixture of lime, cloves, etc.
Pashm	The fine underwool of a species of Tibetan goat, whence the material *pashmina* is obtained.
Pashmina . . .	Woollen cloth obtained from *pashm* wool (see above).
Pebugale . . .	The Rangoon white bean (*phaseolus lunatus*).
Pipul	A sacred tree (*ficus religiosa*) an occasional host of the lac insect.
Poolah	A variety of tobacco grown in Bengal.
Poonac	Strictly speaking the residual cake left in the *chekkus* or mills after extracting coconut oil from copra, but also applied to linseed, gingelly and other oil cakes.
Pucca	An Urdu word meaning good, correct, substantial, of standard quality or measurement, as contrasted with *Kutcha.*
Puttoo	Thick woollen cloth made from the coarser wool of the sheep.

R

Rabi	The spring crop sown during or after the North-East monsoon and harvested in March or April.
Raree	A quality of boiled brown rice, obtainable in Bengal.

S

Sal	A fine timber-yielding tree (*shorea robusta*) which is also a common host of the lac insect.
Sann (hemp) . . .	Fibre obtained from *crotalaria juncea.*
Sari	A piece of cloth of varying lengths with broad coloured borders worn by Indian women.
Sarson	Indian colza, a subspecies of *brassica campestris,* commercially called rape.
Seer	A weight or measure varying in size in different parts of the country (see under Weights and Measures, page 322).
Shatranji	A pileless cotton floor mat.
Shisham	A timber tree (*dalbergia sissoo*).
Shia-zira	The seeds of *carum indicum,* the Indian caraway.
Shroff	A banker or money-changer.
Simal	The red silk cotton tree (*bombax malabaricum*).
Sindine	A variety of tobacco obtainable in Burma.
Sirdar	A headman or overseer.
Siris	A forest tree, (*albizzia lebbek*), a host of the lac insect.
Sujji	The poorest quality of wheat flour.

T

Taluk	A revenue sub-division of a district. (Bombay, Madras and Mysore.)
Tasar	Wild silk worms, *antheræa paphia,* also applied to the cloth made from their silk.
Tarwad (tarwar) . .	See *avaram*
Thindoor	A variety of tobacco obtainable in Burma.
Til (teel)	Gingelly or *sesamum indicum,* the sesame of commerce.
Tincal	Crude borax.
Tola	The weight of a rupee equaivalent to 180 grs. Troy.
Toon	A valuable timber tree also known as the Indian Mahogany (*cedrela toona*).
Toria (tori) . . .	Rape (*brassica campestris*).

Z

Zamindar	A landholder under the Permanent Settlement.

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